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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Erythema Nodosum and Pulmonary Tuberculosis. By Prof. A. WALLGREN, M.D. 359
Diagnosis of Clubbed Fingers. By J. L. LOVIBOND, M.R.C.P. (*illus.*) 363
Prognosis in Malignant Disease of the Testicle. By R. T. PAYNE, F.R.C.S. 364
Psychogenic Headache. By H. WILSON, M.R.C.P. .. 367
Treatment of Schizophrenia by Induced Convulsions. By Lieut.-Col. J. E. DHUNJIBHOY, M.B. 370
Insulin and Cardiazol Convulsion Therapies in the Treatment of Schizophrenia. By H. P. STRECKER, M.D. 371

CLINICAL AND LABORATORY NOTES

Action of Testosterone Propionate on the Uterus and Breast. By A. A. LOESER, M.D. (*illus.*) ... 373
Carcinoma of Pancreas. By J. MACKAY, M.D..... 374

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Surgery: Acute Streptococcal Infections. 377
Section of Psychiatry: Insulin Therapy in Schizophrenia 378
London Association of the Medical Women's Federation: Sulphanilamide in Obstetrics 380
Association of Industrial Medical Officers: Health of the Coal-miner 380
Liverpool Medical Institution: Undescended Testis 375
Devon and Exeter Medico-Chirurgical Society: Radiology of Renal Tumours 376
Southern Medical Society, Glasgow: Paget's Disease of Bone 376

REVIEWS AND NOTICES OF BOOKS

Biological Standardisation of the Vitamins. By Katharine H. Coward, D.Sc. 381
The 1937 Year Book of Eye, Ear, Nose, and Throat. By E. V. L. Brown and others..... 381
Management of Fractures, Dislocations, and Sprains. By Prof. J. A. Key, M.D., and H. E. Conwell, F.A.C.S. 381
The Catholic Doctor. By Fr. A. Bonnar, D.D..... 382

LEADING ARTICLES

THE MODERN FEVER HOSPITAL 383
THE SWEAT GLANDS..... 384
PROGNOSIS OF SCHIZOPHRENIA 384

ANNOTATIONS

Anæsthesia and the Upper Abdomen 386
Presentation to Sir Arthur Keith..... 385
Experimental Renal Hypertension 386
Lethal Gases in Hygiene.. 386
Idiosyncrasy to Tobacco.. 387
Fractures of the Hands and Feet 387
The Normal Electroencephalogram..... 388
Barbiturate Poisoning 388
Sternal Puncture 389
Male Hormones in Gynæcological Practice 389
The Hanbury Medal 390
Pigmentation and Stature. 390
A New Research Fellowship 390

THE SERVICES

Health of the Air Force—Parkes Memorial Prize.. 401

PANEL AND CONTRACT PRACTICE

Irregular Issue of Prescriptions—The National Formulary—Expensive Drugs—Getting Rid of a Patient 402

SPECIAL ARTICLES

Diphtheria—a Preventable Disease. By Prof. J. G. FITZGERALD, M.D, Prof. D. T. FRASER, M.D., N. E. MCKINNON, M.D., and MARY A. ROSS (*illus.*) .. 391
Medicine and the Law: Borrowing a Doctor's Name—Deaths in Maternity Home 397
Ireland: Defence of the Voluntary Hospital—Nominating Bodies for the Senate Panels..... 397
Scotland: Midwifery at Dundee—Highlands and Islands Medical Service. 398
United States of America: A Federal Health Department—Funds for Poliomyelitis Campaign—Births and Deaths 399

THE LANCET 100 Years Ago 405

GRAINS AND SCRUPLES

From a Hospital Physician (II) 400

CORRESPONDENCE

Streptococcal Meningitis (Mr. T. B. Layton, F.R.C.S.) 403
Urticaria during Blood Transfusion (Dr. G. Thurston) 403
Fomites in Tuberculosis (Dr. C. G. Learoyd).... 404
Erythrocyte Sedimentation and the Plasma Fibrinogen (Dr. D. Jennings). 404
Medical Degrees at Hong-Kong (Prof. L. T. Ride, B.M.) 404
Control of a Typhoid Epidemic (Dr. R. Taylor) .. 404
Relative Importance of Infectious Diseases (Dr. A. Topping) 405
Contraception and Fertility (Mrs. M. A. Pyke)..... 405

PUBLIC HEALTH

Local Outbreaks of Typhoid—The Comprehensive Health Visitor 410
Infectious Disease in England and Wales 405

OBITUARY

Sir James Crichton-Browne, M.D., F.R.S. (*with portrait*)..... 406
Albert Edward Hodder, M.B. (*with portrait*)..... 407
Thomas Donnelly, M.D.... 407
Ernest Harold Drinkwater, L.S.A. 407
Percy Coleman, M.B. 407

PARLIAMENT

Vital Statistics..... 408
Notes on Current Topics: Botulism on British Steamer—Blind Persons Bill—Prevention of Road Accidents 408
Question Time: Miners' Nystagmus—Alcohol and Motor Accidents—Anti-Gas Training—Nursery Schools—Typhoid Fever in Somerset 409

MEDICAL NEWS

University of Cambridge .. 411
University of London 411
University of Durham 411
Scottish Conjoint Board... 411
Royal College of Physicians of Edinburgh 411
Course in Venereal Diseases 411
Hospitals for Civilian Casualties in Scotland .. 412
Institute of British Surgical Technicians..... 379
Absorption of Fat 410

NOTES, COMMENTS, AND ABSTRACTS

An International Pharmacopœia 414
Portraits of the Hunters .. 414
Hospital Libraries Abroad. 414
Rabies in Venezuela..... 415
Opium and Cocaine 415
New Trypanocides 415
Baron Alibert 415
Facilities for Radium Treatment 416
New Preparations: Carbomucil—Staphylococcus Antitoxin—Azochloramid 416
Annual Charities Register, 1938 416

Medical Diary 412
Vacancies 413
Appointments 413
Births, Marriages, Deaths 416

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ANY assessment of success or failure in medicine which is based on fact rather than on opinion must nearly always be expressed in some numerical form—e.g., when the medical observer reports that he has treated so many cases with a favourable result in such and such a proportion, or the public health worker assesses the attack-rate on a population inoculated against some infection. We have reason to believe that there is now a steadily increasing demand among both clinical and public health workers for some knowledge of the elementary statistical technique, which will enable them to interpret figures or to analyse and test their meaning. Dr. Hill has succeeded in demonstrating clearly some of the ways in which investigations can be planned and figures derived from them can be analysed in order to yield fruitful results, choosing examples from medical publications to illustrate both the types of problems with which the medical worker is faced and the kinds of error he is most liable to make.

CONTENTS

CHAP.		PAGE
I.	THE AIM OF THE STATISTICAL METHOD	1
II.	SELECTION	9
III.	PRESENTATION OF STATISTICS	19
IV.	THE VARIABILITY OF OBSERVATIONS	29
V.	CALCULATION OF THE STANDARD DEVIATION	38
VI.	PROBLEMS OF SAMPLING: AVERAGES	47
VII.	FURTHER PROBLEMS OF SAMPLING: PROPORTIONS	58
VIII.	FURTHER PROBLEMS OF SAMPLING: DIFFERENCES	68
IX.	FURTHER PROBLEMS OF SAMPLING: χ^2	78
X.	FURTHER EXAMPLES AND DISCUSSION OF χ^2	87
XI.	THE COEFFICIENT OF CORRELATION	97
XII.	CALCULATION OF THE CORRELATION COEFFICIENT	110
XIII.	LIFE TABLES AND SURVIVAL AFTER TREATMENT	117
XIV.	COMMON FALLACIES AND DIFFICULTIES	125
XV.	FURTHER FALLACIES AND DIFFICULTIES	135
XVI.	FURTHER FALLACIES AND DIFFICULTIES	144
XVII.	GENERAL SUMMARY AND CONCLUSIONS	153
	DEFINITIONS	165
	INDEX	169

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ADDRESSES AND ORIGINAL ARTICLES

ERYTHEMA NODOSUM AND PULMONARY TUBERCULOSIS *

By Arvid Wallgren, M.D.

SENIOR PHYSICIAN TO THE CHILDREN'S HOSPITAL, GOTHENBURG

The majority of children with erythema nodosum give a positive reaction with tuberculin. The frequency with which tuberculous infection occurs in erythema nodosum, however, varies somewhat in different countries. It is very high in Sweden, amounting to about 95 per cent.; in England it is about 70 per cent. (Collis 1931–33, 1935).

On the whole the incidence of tuberculous infection among children with erythema nodosum is always higher than that among children in general. If all children aged 1–15 are considered together the proportion with tuberculous infection is normally about 25 per cent.—a figure varying naturally in different countries, towns, and rural districts. But if we study the conditions in different age-groups (Table I) the difference between those with the erythema and normal children becomes still greater, the tuberculin test showing that children with erythema nodosum are infected with tuberculosis much more frequently than are children in general. Since this is no accidental occurrence but characteristic for erythema nodosum in all countries, it is reasonable to suspect a connexion between tuberculosis and this cutaneous eruption.

TABLE I—INCIDENCE OF POSITIVE TUBERCULIN REACTIONS: ERYTHEMA NODOSUM (800 CASES) COMPARED WITH THE NORMAL

Age-groups in years	*1–3*	*3–7*	*7–10*	*10–15*
Children with erythema nodosum (per cent.) ..	96·4	95·6	96·5	95·8
Children in general (per cent.)	10	25	30	40

This suspicion is confirmed to a great extent if a close examination is made of tuberculin-positive children with erythema nodosum. If routine tuberculin tests are made on children in general it is rarely possible to demonstrate clinically any active tuberculosis among those giving a positive reaction, only about 5–10 per cent. showing manifest signs. It is quite the reverse in those affected with erythema nodosum, for the majority present signs of active disease (Table II).

TABLE II—SIGNS OF DISEASE IN TUBERCULIN-POSITIVE REACTORS

	Findings (clinical and X ray)		
	Positive.	Negative.	Total.
Children with erythema nodosum .	248 (68·5%) ..	48 (13·3%) ..	362
Children in general	70 (7·1%) ..	878 (90·6%) ..	969

Questionable cases are excluded.

X RAY FINDINGS

Since the tuberculous infection, with but few exceptions, takes place aerogenously, in my experience an X ray examination furnishes very important information. In Table II the negative X ray findings also include changes that indicate a healed process, such as calcified or indurated foci. Among positive findings have been classified all those children manifesting the following: definite extrathoracic disease; pathologically enlarged hilar shadows; infiltration in the lung parenchyma (instances where röntgenological signs of healing are wanting). The characteristic feature of these changes is the absence of sharp demarcation and the homogeneous and soft appearance of the lesions.

Thus both röntgenological and clinical examination reveal that the great majority of children with erythema nodosum are carriers of active pulmonary disease, lesions of the tracheobronchial glands or extrathoracic processes. We are dealing, therefore, not only with a tuberculous infection but with an active pulmonary or extrathoracic disease. X ray examination of tuberculin-positive children in general shows on the contrary that such children rarely suffer from active diseases.

These röntgenological changes, however, are in no way characteristic of tuberculosis. It is only by subsequent examination that they can be shown to develop in a different manner from ordinary pneumonic processes. They are more chronic and remain practically unchanged for several months. After a year or two calcified foci can frequently be shown in the sites of the previous infiltration. It is true that calcification is not in itself a pathognomonic sign that the lesion was tuberculous, but any other cause is so very unusual that one is practically always justified in regarding it as evidence of the tuberculous origin of the process.

The fact that it is seldom possible to obtain anatomical control material has of course helped to make the interpretation still more confused. In those exceptional cases where the children died—generally from meningitis or miliary tuberculosis—the post-mortem examination furnished proof that the indurations of the lung observed during life corresponded to fresh, genuine tuberculous changes.

SWALLOWED SPUTUM

In rare cases the tuberculosis is not intrathoracic but is localised at sites more accessible to direct inspection, palpation, aspiration, and biopsy, definite proof being obtained during life. But even when intrathoracic changes are met with in erythema nodosum very often it has been possible to prove during life and during the active stage that it really is tuberculosis—by demonstrating the bacilli themselves. As a rule children have no sputum; if they do have any, they swallow it. It is therefore rarely possible to demonstrate tubercle bacilli in the ordinary way. The swallowed sputum can be recovered, however, by washing out the stomach, and the bacilli may be found in the gastric contents. This examination has also been made on tuberculin-positive subjects with erythema nodosum, and it has been possible to show that a large proportion excrete virulent tubercle bacilli. The younger the child and the more extensive the pulmonary process demonstrated röntgenologically the more frequently the bacilli are shown. This appears from the result of the examination of 119 cases summarised in Table III. These figures are

TABLE III—TUBERCLE BACILLI IN GASTRIC CONTENTS

	Röntgenological changes.		*Age—*	
	Extensive.	Minor.	*1–7*	*10–15*
Bacilli present (per cent.) ..	78	24	57·7%	47·5%
Bacilli absent (per cent.) ..	22	76	42·3%	52·5%

* Ingleby lectures for 1937 delivered at the University of Birmingham.

minimum values; other investigators (Opitz 1933) have obtained a higher incidence of positive findings. The farther one pushes this form of bacillary examination and the more tests one carries out, the higher will be the figures obtained. The above investigation is, as a rule, the result of a single test and the bacillus was demonstrated indirectly by inoculation in guinea-pigs.

The fact that bacilli were demonstrated proves that the tuberculosis is active. Such a high incidence of excretion of bacilli is not found in examining tuberculin-positive children in general. In one such examination not more than 6 per cent. of the children were shown to excrete bacilli (Barfred 1936). The older the tuberculous process the less the prospects of demonstrating bacilli, and after a year it is relatively seldom that the gastric contents will contain bacilli. Thus a positive finding indicates not only that the process is active but also that it is recent.

ONSET OF TUBERCULIN SENSITIVITY

One cannot, however, determine the exact age of a tuberculous process without knowing the date of the onset of tuberculin sensitivity. Table IV shows the result of the test in children before and after the onset of the fever preceding the eruption of erythema nodosum. We have been fortunate to observe 133 children who were tested with tuberculin before they were taken ill with erythema nodosum. When a positive reaction was obtained, the tuberculin test was as a rule made cutaneously or percutaneously. Since these tests do not exclude absolutely the possibility of a tuberculous infection, only those cases subjected to an intracutaneous test (0·1–3·0 mg. of tuberculin) have been shown in Table IV. It includes also only those in which erythema nodosum was the first clinical symptom of tuberculosis. It will thus be seen that all these children gave a negative reaction before the fever preceding the erythema, and that all of them reacted positively during and after the fever.

TABLE IV—MANTOUX TESTS BEFORE AND AFTER ONSET OF INITIAL FEVER IN 34 CHILDREN WITH PRIMARY ERYTHEMA NODOSUM

	Relation of test to onset.												
	Before.												After.
	Over 1 yr.	*1 yr.*	*6 m.*	*3 m.*	*2 m.*	*1 m.*	*2 wk.*	*1 wk.*	*Under 1 wk.*				
Positive	0	0	0	0	0	0	0	0	0				34
Negative	19	3	6	1	1	1	1	1	0				0

This signifies that there is no tuberculin sensitivity before the eruption of erythema nodosum, and that tuberculin sensitivity is constantly found during and after the erythematous eruption. Thus the erythema appears at the time when the child becomes tuberculin-sensitive. Since it is not a question of an accidental but of a constant anergy before the eruptive fever, it must indicate that the fever marks the boundary line between the pre-allergic stage and the stage of manifest tuberculous infection. Such a fever, appearing simultaneously with tuberculin sensitivity at the manifestation of tuberculosis, is well known; it is the so-called initial fever. Accordingly the fever preceding and accompanying erythema nodosum in tuberculin-positive children must be considered as the initial fever of tuberculosis.

Sensitivity to tuberculin arises at the end of the period of incubation, which lasts 3–8 weeks. If erythema nodosum behaves in the manner here described, the fever should set in 3–8 weeks after the tuberculous infection has taken place; this does in fact seem to be the case. In 13 cases of erythema nodosum accurate information was obtained concerning the time of exposure to infection, and this occurred so far in advance of the fever that the interval corresponded to the incubation period of tuberculosis (Table V).

TABLE V—INCUBATION PERIOD OF PRIMARY TUBERCULOUS ERYTHEMA NODOSUM

Interval in weeks between tuberculous infection and development of erythema.							Total.
<3	*3–4*	*4–5*	*5–6*	*6–7*	*7–8*	*>8*	
0	4	2	4	2	1	0	13

Specificity

From what has been said it is thus evident that erythema nodosum in these children has occurred simultaneously with the tuberculous allergy (tuberculin sensitivity, perifocal reaction, fever), when the period of incubation of the tuberculosis has expired. The erythema itself has been regarded as an expression of this allergy. Such a conception agrees very much with the clinical picture, the anatomical appearance, and the local absence of tubercle bacilli in the nodules.

The sudden appearance, disappearance, and speedy morphological transformation of the nodules are incompatible with a true tuberculous process. That the nodules are not to be regarded anatomically as tuberculous is shown by their histological structure. The nodule is not made up of the typical tissue, but is characteristic of a non-specific acute inflammatory process. No histological pictures have ever been shown to prove a tuberculous origin. Nor has it been possible to demonstrate tubercle bacilli in all the examinations made for that purpose, either in Scandinavia or England. A few isolated reports of positive findings are on record, and even if these findings must be considered as conclusive, the organisms may have originated from an admixture of blood containing bacilli—bacillæmia during the primary stage of tuberculosis—and need not indicate that the anatomical changes have been produced by direct focal action of tubercle bacilli.

These facts indicate that the eruption cannot be regarded as specific. Erythema nodosum must be a non-specific syndrome. This conception of the erythema agrees very well with a number of other relevant observations. One of these was mentioned at the beginning of this paper—that erythema nodosum occurs in other children besides those affected with tuberculosis. There are no histological or clinical differences, however, between erythematous nodules occurring in tuberculin-negative and tuberculin-positive individuals. In the former the erythema occurs as a rule in association with an acute infection or other conditions that may possibly influence the allergy of the individual. Urticaria, for instance, appears not infrequently in conjunction with an acute infection. I will return to these tuberculin-negative cases of erythema nodosum later.

The view that the erythema is a non-specific allergic manifestation of disease agrees also very well with the particularly high degree of allergy at the manifestation of the primary tuberculosis. If we regard as the average value the degree of the tuberculin sensitivity in tuberculin-positive children in general, we shall find that it differs from that present during the eruption of erythema nodosum. The latter children are as a rule more sensitive to tuberculin than the former (Table VI).

The erythema nodosum does not occur in infants, in whom the tuberculous allergy is but slightly developed even during the fresh primary stage.

In 40 infants with active tuberculosis positive tuberculin reactions were elicited with as high dilution of tuberculin as 0·001 mg. in only one instance, in 67·5 per cent. of the cases with 0·01 mg., and in 30 per cent. with 0·1 mg. By way of comparison I may mention that

TABLE VI—TUBERCULIN SENSITIVITY IN CHILDREN WITH ERYTHEMA NODOSUM COMPARED WITH THAT IN TUBERCULIN-POSITIVE CHILDREN IN GENERAL

	Degree of tuberculin sensitivity in mg.								Total
	0·000001	0·00001	0·0001	0·001	0·01	0·1	1	10	
Children with erythema nodosum.	1	9	3	49	195	14	0	0	271
Tuberculin pos. children in general.	0	0	0	3	160	124	34	0	321

in 162 cases of fresh primary tuberculosis without erythema nodosum in children above infant age, a positive tuberculin reaction was obtained with 0·0001 mg. in one case, with 0·001 mg. in 10 per cent. of the cases, and with as low dilution as 0·1 mg. in only 18·5 per cent.

THE "POST-PRIMARY" TYPE

The conception of erythema nodosum as a non-specific allergic phenomenon agrees also very well with the manner in which it appears in individuals who were infected a long time ago—the so-called "post-primary" erythema nodosum. In our experience with children such cases have indeed been rare. Among a total of 800 cases of erythema nodosum only 16 belonged to this category. A careful scrutiny of these shows that the eruption was preceded by an acute infection of some kind. The erythema did not appear until immediately *after* (measles) or *towards the end* (pertussis) of the acute infectious disease. Judging from our experience so far, this is a constant phenomenon, which is quite reverse to the conditions in erythema nodosum in tuberculin-negative children after an acute infection. In such children the erythema usually appears *during the progress* of the acute infection and not after it has run its course. This dissimilarity indicates that the mechanism producing erythema nodosum is different in the two cases. The post-primary tuberculous erythema nodosum appears during recovery from the effect of the acute infection. The tuberculin-negative cases of erythema nodosum are ushered in as an immediate effect of this acute infection.

EFFECT OF ACUTE INFECTIONS

The explanation of the development of post-primary tuberculous erythema nodosum can most readily be obtained if we consider the well-known effect of measles in temporarily decreasing the tuberculin sensitivity of a tuberculous child; this increases again some days after the fever has subsided. While the sensitivity to tuberculin is minimum, the child is, allergically speaking, at the same starting-point as when it first became allergic at the manifestation of primary infection: the tuberculin sensitivity increases rapidly. It is at a corresponding point that the ordinary tuberculous erythema nodosum arises, and it is at this point too that the post-primary erythema appears. Thus, a few days after fever has subsided after measles, there is a new elevation of the temperature curve, in the course of which the erythema makes its appearance.

Most acute infections have more or less the same effect as measles. The time relationship between the onset of the acute infection and the eruption of erythema nodosum varies somewhat, according to the time when the decrease in allergy sets in and its duration. Thus in pertussis there is an interval of several weeks between the onset of the whooping-cough and the erythematous eruption.

It will thus be seen that even erythema nodosum in children with old tuberculous foci can be explained as a tuberculous allergic phenomenon. An experimental observation that has been made on several occasions and by different investigators, and which therefore must be regarded as conclusive evidence, is that *an injection of tuberculin can provoke a new eruption of erythema nodosum.* If a tuberculin-positive child in the convalescent stage after an erythema nodosum is injected with a sufficient dose of tuberculin to produce a certain general reaction, this may sometimes provoke a new eruption of erythema nodosum. It is a well-known fact that such a dose of tuberculin produces an undulation in the allergic level, and it is during this undulation that the erythema occurs.

We have thus dealt with the tuberculous type of erythema nodosum in its different forms, the primary and the post-primary. In summary it might be said that erythema nodosum is in itself a non-specific allergic manifestation of disease, which in children finds its most favourable conditions of development in the tuberculous allergy. It occurs as a concurrent phenomenon in the increase of this allergy, particularly at the time of the manifestation of the primary tuberculosis. In addition to this primary type there is a rather rare post-primary form of tuberculous erythema nodosum. The latter occurs when the allergic state is modified, for instance by certain acute infections.

Ætiology

That erythema nodosum is ætiologically a non-specific syndrome is evident from the fact that it occurs occasionally in other infections besides tuberculosis. As mentioned in the introduction the frequency with which tuberculosis, on the one hand, and other infections, on the other, are the cause of erythema varies in different countries. Whereas in Sweden only 5 per cent. of the cases of erythema nodosum are non-tuberculous, in England, for instance, the percentage is six times greater.

As I have already pointed out, there is no clinical, histological, or bacteriological differences between the tuberculous and the non-tuberculous forms of erythema nodosum. I have once observed that the same child has primarily suffered from a non-tuberculous erythema nodosum, and secondarily, six months later, from a tuberculous erythema. The condition for the development of the erythema, both in tuberculin-positive and in tuberculin-negative children, is a predisposition in the individual to react in the manner described. Erythema nodosum agrees in this respect with other allergic manifestations of disease. This predisposition is found only in certain individuals. It is much more common among women than among men, in some families more than in others, and in one country more than another. The degree of the predisposition varies too; in some the erythema occurs repeatedly—in one tuberculin-negative case there were no less than 10 eruptions, at intervals of a year or so, and each time after an attack of tonsillitis—but in the majority it appears only once in their lifetime.

UPPER RESPIRATORY INFECTIONS

Tonsillitis or other acute infections of the upper respiratory tract are the most common conditions that precede erythema nodosum in tuberculin-negative cases. In 34 children with such an erythema

nodosum I encountered the following infections that might possibly be the cause of the erythema:—

	Cases.		Cases.
Acute pharyngitis ..	13	Enterocolitis	1
Tonsillitis	8	Rheumatic fever ..	1
Otitis	2	Acute infection absent	3
Pneumonia	2	No data	2
Tonsillary abscess ..	1		
Septic wounds	1	Total ..	34

It is noteworthy that in three of the cases no other demonstrable disturbance occurred than the erythema, which by no means signifies that every kind of infection was absent in these cases.

Erythema nodosum in a tuberculin-negative child can also occur as a result of other infections besides those mentioned above; it has, for instance, been described in syphilis and lymphogranuloma inguinale. I should like to deal more extensively with two of the above-mentioned infections—namely, pharyngitis or tonsillitis, which are the most common, and rheumatic fever, which seems to be among the rarest infections producing erythema nodosum.

In most of the cases, 24 out of 34, the acute infections were catarrhal diseases of the upper respiratory tract. It is not surprising that these entities are the most common causal infections, since the bulk of childhood infections are comprised by those maladies. Every acute pharyngeal infection, however, is not able to provoke erythema nodosum to the same degree in a predisposed individual. From Collis's investigations it appears that it is especially those infections caused by hæmolytic streptococci which are followed by erythema nodosum. Collis has also shown that the majority of all tuberculin-negative children with the erythema react positively with an endotoxin made by hæmolytic streptococci, isolated from their tonsillitis and other pharyngeal infections. I have also had the opportunity of testing this toxin on five tuberculin-negative children with erythema nodosum, in all of whom I was able to confirm a high degree of sensitivity to the toxin. It seems probable that Collis is right in assuming that erythema nodosum is an expression of streptococcal allergy in certain cases. In some of the erythemas in tuberculin-negative individuals, however, no hypersensitivity to the streptococcus toxin is elicited (Collis), and one must necessarily suppose that these individuals are allergic toward some other bacterial allergen.

RHEUMATIC FEVER

The opinion that rheumatic fever may be the cause of erythema nodosum has prevailed for the last 50 years, and this opinion has especially been advocated in England. The evidence advanced in support of this conception has not been convincing enough to be accepted. This opinion has mainly been based on the fact that rheumatic pains not infrequently occur in association with the erythema, especially in adults. But these pains are by no means characteristic and they occur just as often in tuberculin-positive as in tuberculin-negative individuals with erythema nodosum. Occasionally it has been possible to demonstrate objective cardiac symptoms in support of the rheumatic fever origin. In several such cases, however, no proof has been submitted to show that the murmur heard was not accidental. Even in other cases with evident organic cardiac lesions it was not proved that this change became manifest or intensified during the erythematous eruption. Neither was it shown that the two manifestations of disease were in any way associated with one another. Finally, the common and serious mistake has been not to determine whether the tuberculin reaction was positive or negative. It is only in definitely tuberculin-negative individuals that it is possible to show that erythema nodosum is a manifestation of any agent other than tuberculous allergy. Even if a rheumatic endocarditis appears simultaneously with an eruption of erythema nodosum, in the presence of active or latent tuberculosis, there is all the more reason for assuming that the tuberculosis and not the rheumatic fever is the cause of the erythema nodosum. At any rate, in such a case it cannot be regarded as proved that the erythema owes its occurrence to the rheumatic allergy. That a rheumatic fever may be the cause of an erythema nodosum is shown by the following case.

A boy, aged 11, became ill with erythema nodosum, during which he showed, in addition to troublesome symptoms of polyarthritis, signs of endomyocarditis that resembled a rheumatic cardiac change. He did not react to 10 mg. of tuberculin; the test was repeated six weeks later with the same result. When discharged from hospital he was still suffering from slight valvular heart disease. The only discernible cause of the erythema was the rheumatic affection.

Acute rheumatic fever, therefore, is obviously one of the diseases that can be intimately associated with erythema nodosum. The part it plays, however, has been greatly exaggerated, and at least in Sweden it is but rarely the cause of the eruption. Among our 800 cases that just referred to is the only instance of erythema caused by rheumatic fever.

Conclusions

It is thus my opinion that erythema nodosum is to be regarded as a *non-specific allergic cutaneous eruption*, which appears especially in tuberculosis and occasionally in other infections, and may possibly be provoked by non-infectious agents. This view is undoubtedly held by the majority of pædiatricians in Scandinavia and on the Continent, and I know that it has many advocates also in England. There is, however, a group of physicians (Symes 1928, Fornara 1930) who hold that the erythema is an expression of a *specific* infectious disease, appearing only when quite exceptional allergic conditions are present in the affected person. Quite apart from the fact that no other instance of an acute specific infectious disease with such peculiar allergic demands on the patient has been seen so far, there are a number of other peculiarities in the manner in which the erythema appears that argue against such a view. I shall here draw attention to only two of them: the possibility of provoking a new attack of the disease in tuberculous subjects by the injection of tuberculin (Ernberg 1921), the great tendency in certain cases to relapses, which is quite foreign to the nature of a specific exanthematous disease.

The epidemics of erythema nodosum that have been described and that form one of the supports of its being an expression of an acute specific infectious disease are given a natural explanation by the view advanced here of the origin of the erythema. Let us suppose, for instance, that a group of children is simultaneously infected with tuberculosis, and that among these children there are several having a predisposition to react with erythema nodosum, on the development of allergy. Then we should expect that an eruption of erythema would occur after the expiration of the period of incubation of tuberculosis. Since the period of incubation varies only slightly, the tuberculous allergy would appear at approximately the same time and thereby an apparent endemic of the erythema would occur. Several such endemics of erythema nodosum of this

kind have been described and I have personally had the opportunity of studying 10 of them.

PRACTICAL SIGNIFICANCE

The importance of erythema nodosum is that this disease entity may serve as a diagnostic agent for detecting a fresh tuberculous infection. In this way the erythema makes it possible for us to detect the presence of active tuberculosis at a very early stage of the disease. It is of great value too in revealing the source of infection. In a tuberculin-positive individual it nearly always indicates that the tuberculous infection took place 3–8 weeks previously. This information greatly facilitates the discovery of the cause of the infection. Erythema nodosum in a tuberculin-negative child seems to offer no guidance or assistance in our clinical work.

The tuberculous erythema nodosum in itself is not a sign of any special malignancy. Everything considered, primary tuberculosis behaves in exactly the same way whether there is erythema nodosum or not. On the contrary, it may be regarded as a favourable syndrome for the individual, in that the eruption helps in the diagnosis of a tuberculous infection at a very early stage, and thus making it possible to commence appropriate treatment immediately.

DIAGNOSIS OF CLUBBED FINGERS

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A simple inspection of the patient's outstretched fingers is a part of the clinical examination that can provide information of considerable value in diagnosis. The discovery of clubbed fingers is at the same time satisfying to the clinician and condemning to the patient, for it is a condition long known to be associated with grave disease. Let us suppose that the presence of clubbing of the terminal phalanges is obvious; there will then be no dispute on the authority of the sign. But more often it happens that academic doubt is expressed on the degree of clubbing present, so that the diagnosis of "slight curving" or of "suspicious early clubbing" is made. Clubbing must surely be either present or absent; its presence signifies disease which its absence does not exclude. In our zeal we tend unwittingly to deceive ourselves over the equivocal case, yet were we able to establish criteria of diagnosis this problem would be simplified. It has rightly been said (West 1897) that clubbing is one of those phenomena with which we are all so familiar that we appear to know more about it than we really do.

ÆTIOLOGY

Before attempting to put forward any such standards of judgment let us briefly review the modern conception of clubbed fingers and of their ætiology. If it is realised that in any series of healthy individuals the peripheral circulation and the conformity of the fingers themselves both vary within wide limits of the so-called normal, then it is easier to account for the anomalies relating to clubbing. For example, even in the diseases with which it is most frequently associated clubbing is really far more often absent than present. It is manifestly a malady of the nail beds, or, more correctly, of the soft tissues between the nail bed and the bone. Although the true pathology is still in dispute it seems likely that chronic passive congestion of the capillaries of the nail bed brings about an œdema of the tissues deep to it, which in turn is followed by trophic changes resulting in clubbing. An essential contributory factor that must be present before the characteristic reaction will occur is a chronic anoxæmia of the blood in the terminal arterioles (Campbell 1924) such as obtains in many states of pulmonary and cardiac disease. It is thought that all venous blood contains toxic substances tending to provoke the typical changes in the fingers. Normally these toxins are removed from the blood in its passage through the lungs, hence pulmonary disease predisposes to clubbing.

The peculiar selectivity for the digits as the seat of the process may perhaps be explained by a certain vulnerability of the capillaries in this part of the body where the circulation is ordinarily slow. Thus cyanosis may be observed in the nail beds before it is apparent elsewhere, particularly in pneumonia and in chronic and miliary pulmonary tuberculosis. The pathology of clubbing of the toes is precisely similar. An exaggeration of the same morbid process is also held responsible for the changes which arise in hypertrophic pulmonary osteo-arthropathy. Many other less satisfactory theories have been propounded. These include vitamin-A deficiency, the "arthritic diathesis," an increase in subungual fat, and an ætiology akin to amyloid disease, but they have met with full discussion in previous communications and need not detain us here.

From the foregoing account it is evident that clubbing is unlikely to arise in the event of a simple mechanical obstruction to the veins. Therefore clubbed fingers do not follow superior caval obstruction, neither are they found in cases of œdema due to congestive heart failure, or to thrombophlebitis. The conditions in which clubbing is commonest may be classified as follows:—

Pulmonary disease.—Bronchiectasis, lung abscess, chronic empyema, primary or secondary lung tumours, fibroid pulmonary tuberculosis with excavation, chronic broncho-pneumonia.

Cardiovascular disease.—Congenital morbus cordis, infective endocarditis, polycythæmia rubra. It is rare in acquired heart disease, but unilateral clubbing has been recorded with aortic aneurysm.

Mixed group.—This includes the cases described in association with chronic jaundice, cirrhosis hepatis, enterogenous cyanosis, &c. A familial type, of unknown ætiology, is also described. The varieties of true clubbing in this group are so rare as to be of academical interest only.

DIAGNOSIS

We are concerned here with the clinical diagnosis of clubbing of the fingers and of the less obvious cases in particular. Clubbing is commonly seen first in the thumb and index digit, and spreads to the others later. The process starts at the root of the nail just beyond the interphalangeal joint as a definite, firm, transverse ridge more obvious on the dorsal aspect of the finger. The overlying skin is smooth and shiny, the patient often complaining that the cuticle has begun to grow more rapidly over the nail. A vascular turgescence of the nail bed in the early stages imparts a lilac hue, and in the well-developed clubbed finger a full, rounded, and cyanotic appearance. The sluggish circulation is apparent from the slow return of colour after slight pressure on the nail (Witherspoon 1936). As the deformity develops the base of the nail becomes elevated so that its outline may be discerned beneath the skin. In severe clubbing the nail can be rocked backwards and forwards, giving the impression that

it is floating on a soft œdematous pad. If the clubbing is long-standing, as in congenital heart disease, the terminal phalanx may become hyperextended. Muscular wasting of the hands and fingers accentuates these changes, especially in the milder cases.

The sign is said to be eight times more common in men than in women. No age is exempt. With lung abscess it may appear in as brief a period as ten days, but more usually it takes a few weeks or even months to be established. In cases of pulmonary sepsis treated by surgical drainage or lobectomy clubbing may recede in an equally short interval of time (Craig 1937). Clubbing of prolonged duration probably never entirely disappears. Although they often look sore clubbed fingers are painless, except possibly with a very rapid onset. Gross clubbing produces bulbous finger-ends to which have been applied such picturesque epithets as "serpent's head," "parrot's beak," "drumstick," and in France "doigts Hippocratiques," an allusion to the Father of Medicine who recognised clubbing as a sign of empyema and advanced pulmonary tuberculosis. Radiograms of clubbed fingers usually show no evidence of bony change, but in chronic severe clubbing an irregular, mossy, or burr-like proliferation of the distal half of the terminal phalanx may be seen; in a few instances long spur-like projections are present.

The condition of clubbing has to be differentiated from certain other disorders of the fingers. Notable among these is chronic paronychia, but here it is the soft tissues at the base of the nail that are swollen, not the nail bed. Heberden's nodes are bony swellings in the elderly distal to the interphalangeal joints, and can thus be distinguished from the clubbing deformity. Chronic infective arthritis causes peri-articular swelling. In these conditions there is no alteration in the conformity of the nail bed. A subungual whitlow may resemble a clubbed finger, but the associated pain and the absence of changes in other fingers will serve to define it. Various occupations, such as boot-making, saddlery, and sailmaking, after long years modify the shape of the fingers by broadening or thickening them with callosities; these should not be confused with clubbing.

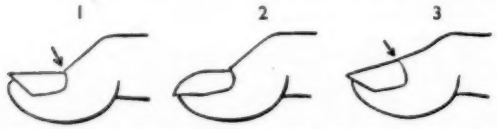

FIG. 1.—Normal finger, showing base angle of nail (usually about 160°).

FIG. 2.—"Curving" of nail, a variation of the normal. N.B.—Essential base angle is preserved.

FIG. 3.—Mild clubbing. N.B.—Base angle obliterated. (Clubbed finger-nails may also be curved.)

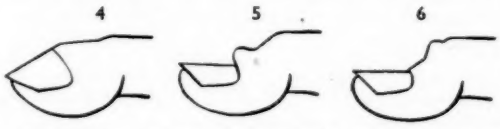

FIG. 4.—Gross clubbing ("drumstick," &c.). Base of nail projects. N.B.—Diameter of finger at nail base is increased in both dimensions.

FIG. 5.—Chronic paronychia. Fundamental base angle of nail unaltered.

FIG. 6.—Heberden's node. Base angle of nail normal.

THE PROFILE SIGN

From what has already been said it is manifest that the diagnosis of clubbing of the fingers is one of some importance since it may, for example, draw attention unexpectedly to the chest as the seat of the patient's symptoms. In those cases where the signs of clubbing might seem to be doubtful a consideration of the silhouette of the terminal phalanges provides a simple clue to the identity of the condition. From a perusal of the illustrations it will be seen that the normal nail proceeds from the finger at an obtuse angle of about 160° (Fig. 1). This is peculiarly well seen in the normal thumb. When "curving" is present the fundamental angle between phalanx and nail is undisturbed, but the distal part of the nail is curved downwards, maybe very considerably (Fig. 2). Most finger-nails are slightly curved, with the obvious exception of nails that show koilonychia; some distal curving of the nail may, therefore, accompany clubbing. Clubbing can be differentiated from curving, and, indeed, from other conditions, because even in its mildest form *this essential angle is characteristically obliterated* (Fig. 3). With gross clubbing the angle at the base of the nail becomes greater than 180° and projects (Fig. 4). In paronychia this angle again bears its normal relations, and it is the inflamed soft tissue round the nail base which protrudes (Fig. 5). Even when pronounced curving accompanies paronychia it should not be confused with clubbing, because the base angle of the nail is always preserved. The prominence produced by a Heberden's node lies still more proximally, and rarely engenders diagnostic difficulty (Fig. 6).

It is, unfortunately, never possible to emphasise the minor degrees of organic change, so commonly encountered in disease, without perhaps ruthless dogmatism. This method of describing the deformity that characterises the clubbed finger has proved to be of some value when attempting to explain the condition to students. It is, therefore, hoped that it will be found helpful to the clinician in those many difficult cases that confront him where there are small, yet not less significant, degrees of clubbed fingers.

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PROGNOSIS IN MALIGNANT DISEASE OF THE TESTICLE

A FOLLOW-UP OF THIRTY-EIGHT CASES *

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MALIGNANT growths of the testicle have an unenviable reputation. This is due to the relatively late stage at which many of the patients come under observation, to the technical difficulties of the radical operation itself, and to the rapid dissemination of these growths by the blood and lymph streams. For these reasons, an attitude of mind has developed in connexion with the treatment of testicular tumours largely dominated by the hopelessness of the prognosis. For example, Romanis and Mitchiner [1] state:

* A paper contributed at a meeting of the Society of Radiotherapists of Great Britain and Ireland.

[1] Romanis, W. H. C., and Mitchiner, P. H. (1934) The Science and Practice of Surgery, London.

"Prognosis is always grave, the majority of cases dying from metastases, often cerebral, about a year from the onset of the tumour." Current teaching has favoured a rather fatalistic outlook towards the disease, which would almost suggest that the cases are not worth operating on. For many years it has been my practice to teach that malignant disease of the testicle has not necessarily so gloomy a prognosis as the text-books often suggest.

The present paper is based on a series of 38 patients with malignant disease of the testicle treated by means of orchidectomy at St. Bartholomew's Hospital during the years 1920–33. In all of these the diagnosis was confirmed pathologically, and only one case during this period has been excluded from the series on the grounds of the absence of pathological data. The orchidectomy was a local operation, and no case was subjected to the radical operation. In addition to the orchidectomy, other treatment was carried out in some of the patients, including the excision of inguinal glands, the insertion of radon to abdominal glands, and the use of X rays.

Of the 38 cases now recorded, all but 4 have been traced. Details are set out in the Table. As the present paper is concerned almost entirely with prognosis, the other data are only discussed in so far as they have any bearing on this question.

RESULTS OF FOLLOW-UP

The results of the follow-up of the cases were as follows:—

Deaths:		
From operation	2	= 16
From disease	14	
Not traced	4	= 4
Cures:		
Five years, or more	15	= 18
Four years	2	
Three years five months	1	
Total		38

They are summarised in greater detail in the Table.

Deaths from operation.—Of the 38 cases 2 died as the result of operation. Case 6 died after 7 days. The cause of death was uncertain, and was probably a low-grade broncho-pneumonia, but no post-mortem was held. Case 25 died 12 days after operation as the result of gas gangrene, due to the ulcerated condition of the scrotal skin at the time of operation.

Deaths from disease.—14 cases out of the 38 died as the result of the disease, or their deaths were presumed to be due to disease.

There was evidence of metastases at the time of the orchidectomy in Cases 1, 19, and 34.

In this group 10 died within the two-year period; 3 are known to have lived for periods varying from 2 yrs. 10 mths. to 4 yrs. 1 mth. The latter patient had metastases in the inguinal glands at the time of operation, and was treated by X rays subsequently, and at no stage was free from disease. Case 2 was presumed to have died from the disease but no data are available as to when this occurred.

Cures, five years and over.—15 of the 32 cases operated on before April, 1932, survived the five-year period, giving a cure rate of 46·9 per cent.; of these cases 11 are still alive and well. Case 3 has not been traced since 1932 but had then survived a period of 11 years. Cases 8 and 11 died from unknown causes at periods of 10 yrs. and 9 yrs. 2 mths. respectively. Case 9 was in good health for 8 years and then developed a teratoma of the opposite testicle and now has abdominal secondaries.

Cures under five years.—The remaining 6 cases in the series of 38 were operated on within the five-year period. Of these 4 are now dead. The 2 survivors have lived for 4 yrs. 5 mths. and 4 yrs. 7 mths. respectively. Case 29 remained in good health for a period of 3 yrs. 5 mths. but has been untraced since.

HISTOLOGICAL DATA

In all of the cases investigated histological data were available. There were 19 teratomas and 19 seminomas. Under the heading "teratoma" have been included all the tumours having a definitely mixed structure. On the other hand, under the heading of "seminoma" have been included not only the tumours of this type but also those described in the earlier case records as alveolar sarcomas. There were no chorion epitheliomata in the series. Of the cases coming into the five-year cure group, 8 were teratomas and 7 were seminomas. Of the 2 cases coming into the under-five-year cure group, one was a teratoma and the other a seminoma.

DURATION OF SYMPTOMS

The average duration of symptoms before operation was as follows:—

	No. of cases.	Average duration.
Whole group	38	7·5 mths.
Five-year cure	15	7·4 „
Dying from disease	14	8·7 „

The average in the whole group of 7·5 months is a surprisingly long period and one that it should be possible to reduce considerably. It will be seen that the time difference between the five-year cure group and the cases dying from disease was approximately five weeks. This fact in itself suggests that the type of the disease is of outstanding importance.

DIFFERENTIAL DIAGNOSIS

It is not proposed here to discuss the clinical differential diagnosis of testicular swellings. It has to be recognised that diagnosis may often be extremely difficult even to the expert. There are of course mistakes, and in practice it is found that some patients have been subjected to preliminary treatment or preliminary operation without the true state of affairs having been ascertained. It must also be recognised that orchidectomy is at times carried out in the opinion that the testicular condition is malignant. The routine employment of the Wassermann test is essential in all cases.

The Aschheim-Zondek test has of recent years become of some importance in the diagnosis of testicular tumours. The routine use of this test is advocated. In all cases it may give a clue to the embryonal character of the disease, to the extent of the disease, and to its radiosensitivity. A positive result may thus be of great value in a doubtful case. Recurrence of the tumour in other sites may be recognised by the increase of prolan A in the urine. When this is being excreted in large amounts, there may also be hyperplasia of the prostate and seminal vesicles. Gynæcomastia may also occur.

IRRADIATION

Since this paper is concerned primarily with following up a series of cases, the question of irradiation is dealt with only in so far as this method has been employed.

Of the 38 patients 15 were treated by means of some form of irradiation in addition to orchidectomy. This included X rays, deep X rays, and the use of radon in one patient (Case 19). The X rays were employed in some cases therapeutically and in others prophylactically (so-called). Fairly high voltages were used, but Case 32 (1932) was the first one of the series to be treated with deep X rays.

TABULAR SUMMARY OF RESULTS

Case	Date.	Duration (mths.).	Other signs.	Operation.	Histology.	Other treatment.	Survival after operation.
			DEATHS FROM OPERATION (2)				
6	Sept., 1922.	14	Nil.	Orchidectomy.	Seminoma.	Nil.	7 days.
25	March, 1930.	6	Scrotal skin ulcerated.	"	Teratoma.	"	12 days.
			DEATHS FROM DISEASE (14)				
1	Feb., 1920.	18	Glands left groin.	Orchidectomy and excision glands left groin.	Seminoma.	X rays 1921, 1922, 1923.	4 yrs. 1 mth.
2	April, 1921.	3	Nil.	Orchidectomy.	Teratoma.	Nil.	?
13	Oct., 1926.	24	"	"	Seminoma.	"	2 yrs.
15	Jan., 1927.	6	"	"	Teratoma.	3/27, X rays to deposits in liver.	4 mths.
16	May, 1927.	24	"	"	Seminoma.	Nil.	1 yr.
19	Feb., 1928.	4	Aortic glands.	Orchidectomy and radon to aortic glands.	Teratoma.	Radon to aortic glands.	7 mths.
24	March, 1929.	1	Nil.	Orchidectomy.	Seminoma.	X rays 4/29 and 7/29.	3 yrs. 1 mth.
27	Oct., 1930.	9	"	"	Teratoma.	X rays 2/32 to abdominal glands.	2 yrs. 10 mths.
28	August, 1930.	4	"	"	Seminoma.	X rays 12/30 to lumbar deposits and scar recurrences.	6 mths.
33	Dec., 1932.	6	"	"	Teratoma.	Nil.	1 yr. 1 mth.
34	May, 1932.	5	Huge abdominal metastases, also lungs and spine.	Orchidectomy to relieve weight.	"	"	2 mths.
36	Feb., 1932.	7	Nil.	Orchidectomy.	Seminoma.	Deep X rays 9/32 to glands in abdomen and neck.	9 mths.
37	Nov., 1933.	9	"	"	"	Nil.	1 yr. 11 mths.
38	Oct., 1933.	2	"	"	Teratoma.	Deep X rays.	1 yr. 6 mths.
			NOT TRACED (4)				
4	April, 1921.	6	Nil.	Orchidectomy.	Teratoma.	Nil.	—
5	Sept., 1922.	4	"	"	Seminoma.	"	—
23	August, 1929.	5	"	"	"	"	—
30	May, 1931.	4	"	"	Teratoma.	"	—
			CURES, FIVE YEARS AND OVER (15).				
3	Feb., 1921.	12	Nil.	Orchidectomy.	Teratoma.	Nil.	Not traced since 1932. 11 yrs.
7	Dec., 1923.	2	"	"	"	"	13 yrs. 4 mths.
8	August, 1924.	3	? abdominal glands.	"	"	X rays.	10 yrs.
9	April, 1925.	2	Nil.	"	"	Nil.	8 yrs. Well till 4/33. Then teratoma left testicle. Now abdominal secondaries.
10	March, 1925.	7	"	"	"	"	12 yrs. 1 mth.
11	Jan., 1925.	0·25	"	"	Seminoma.	Abdominal recurrence proved by section 9/25. X rays.	9 yrs. 2 mths.
12	April, 1926.	8	"	"	"	Nil.	11 yrs.
14	June, 1926.	4	"	"	Teratoma.	"	10 yrs. 10 mths.
17*	March, 1921.	18	"	"	Seminoma.	Excision scrotal recurrence 7/27.	16 yrs. 1 mth.
18	Sept., 1928.	12	"	"	"	X rays.	8 yrs. 7 mths.
20	June, 1928.	12	"	"	"	Nil	8 yrs. 10 mths.
21	May, 1928.	15	"	"	Teratoma.	"	8 yrs. 11 mths.
22	Nov., 1929.	4	"	"	"	X rays.	7 yrs. 5 mths.
26	August, 1930.	6	"	"	Seminoma.	Nil.	6 yrs. 8 mths.
31	Sept., 1931.	6	"	"	"	"	5 yrs. 7 mths.
			CURES, FOUR YEARS AND OVER (2)				
32	Nov., 1932.	12	Nil.	Orchidectomy.	Seminoma.	Deep X rays.	4 yrs. 5 mths.
35	August, 1932.	1	"	"	Teratoma.	"	4 yrs. 8 mths.
			CURES, THREE YEARS AND OVER (1).				
29	Nov., 1930.	1	Nil.	Orchidectomy.	Seminoma.	X rays.	Not traced since 4/34. 3 yrs. 5 mths.

* Case 17. The original tumour was excised elsewhere, the present operation being for a scrotal recurrence.

In the 14 cases dying from the disease, 8 had been irradiated. Amongst these the longest survival was Case 1, who lived 4 yrs. 1 mth. At the time of operation the inguinal glands were also involved and were excised. Subsequent to this he was never free from disease.

In the 15 patients in the five-year cure group, irradiation was used in 4 (Cases 8, 11, 18, and 22). Case 11 had an abdominal recurrence eight months after operation which was proved by section to be a seminoma. The patient remained well 9 yrs. 2 mths. after operation, and then died from an unknown cause. In the other 3 there was no definite evidence of metastases at the time of the irradiation.

The two survivors in the under-five-year group (Cases 32 and 35) both received prophylactic X ray treatment. In addition to these, Case 29, who is now untraced but remained well for 3 yrs. 5 mths., also received prophylactic X ray treatment.

It is generally recognised that testicular tumours should, on a priori grounds, be very radiosensitive. Clinical evidence in regard to the response of secondary growths to irradiation strongly supports this view. There is still considerable dispute as to the exact method of deep irradiation, but it seems probable that orchidectomy followed by irradiation should be carried out in all cases. The intensity of the irradiation and its distribution in time are matters that must be left to the radiotherapists themselves.

CONCLUSIONS

This paper concerns an unselected and consecutive series of 38 cases of malignant disease of the testicle from St. Bartholomew's Hospital, 1920–33, all of which were treated by means of orchidectomy and in some of which various forms of radiotherapy were also employed. The outstanding feature of this follow-up is the fact that in no fewer than 15 of the patients (46·9 per cent.) of a possible 32 was there a cure rate of five years or over.

These results show at least that a very high five-year cure rate has been obtained in a disease commonly regarded as almost uniformly fatal, and they may perhaps be of some encouragement to those who have any part in the treatment of patients with malignant disease of the testicle.

There is no doubt that the interval between the initial symptoms and treatment could be considerably reduced. As medical men, we cannot put the entire responsibility of this delay on the patient. Some of it at least is on our side. And in this matter, as in malignant disease in other situations, the doctor's awareness of the possibility of malignancy is likely to be more valuable than making malignant disease a bogy to the general public. The ability of the medical practitioner and the confidence in which he is held by his patient must be the outstanding features in the early recognition of any form of malignant disease.

No attempt has been made on the basis of the present series of cases to lay down any definite rules of treatment. Operation and irradiation may both be able to claim cures, but the number of good results obtained by a combination of these methods may well be greater than those obtained by either method alone.

Malignant disease of the testicle has become the dog with the bad name. I would suggest that, from the practical point of view, the time has come to review critically our attitude to this type of malignant disease.

My thanks are due to Mr. D. F. Ellison Nash for much of the preliminary work involved in the follow-up of the cases.

PSYCHOGENIC HEADACHE

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The text-book descriptions of headaches occurring in the psychoneuroses are widely divergent. Thus Osler distinguishes between the headache of hysteria which is over the sagittal suture, and that of "neurasthenia" where there is a feeling of pressure in the occipital region. Other text-books mention other parts of the head as being affected, and one does not mention the occurrence of headache in hysteria at all.

Of 248 patients referred to the psychotherapist in the neurological department of the London Hospital, 52 had headaches as a prominent symptom. In another series of 165 patients, from whom compensation cases and those with mental defect and frank neuroses were excluded, 49 complained of serious head pain and 20 of milder discomfort. For the present review 75 patients from these two groups were selected, in whom pain in the head was a prominent though not always the only symptom, and in whom "mental disorder," so far as it can be separated from "psychoneurotic disorder," was excluded. These included 39 women and 36 men between the ages of 15 and 53 years, the majority being under 40. A full physical examination had not revealed any disease or defect.

A review of these cases shows that the characters of the pains complained of are so varied that it would seem better simply to state that a sensation of discomfort or pain in the head may accompany all neurotic conditions, and to abandon the assignment of a type of pain to any particular form of neurosis. Psychogenic cephalgia is indeed a good example of the way in which psychoneurotic symptoms may crop up in any form of neurosis, in the same way as in the frank psychoses a paranoid reaction is not confined to paranoia, but may show itself in any psychotic condition. Headaches are an exceedingly common accompaniment of worry in the non-neurotic, and the borderline between a headache of simple worry and the psychoneurotic condition is difficult to define. The headache due to worry should find more of a place in clinical teaching, for some of the chronic headaches included in this series almost certainly started in this way, and the patient's anxiety was stimulated by vague suggestions of more serious disease, when a frank statement that the cause was worry which could probably be surmounted might have led to enthusiasm instead of to fear.

It was found impossible to distinguish any special syndrome in connexion with a particular portion of the head or type of pain. In nearly half of the cases the terms used in describing the symptoms were not exaggerated and there was no evidence of excessive desire for effect. Although fantastic descriptions such as "a pain as if I was going to explode," "creeping feelings under the skin," "a sense of my head being pulled," "tickings," and so forth, are strongly presumptive of a psychogenic condition, the reverse is not true. The emotions caused by the pain often seemed well related to its persistence and disabling effects. To regard as functional only those headaches that are accompanied by gross signs of emotional instability or fantastic description seems clearly fallacious.

It was thought that in these patients there might be difficulty in differentiating between headaches due

to constipation, menstruation, and sudden muscular exertion and those that were truly psychogenic. Actually constipation was uncommon and rarely seemed to cause headaches in these people, and they were able easily to separate the other types from those for which they sought advice. Where a headache was described without undue effect suspicion of a psychogenic origin was first aroused by its onset and disappearance. Thus a headache that occurs fairly regularly on Monday mornings or prevents the patient from doing anything at week-ends suggests a psychogenic and not a physical disorder.

The only division one could fairly make in the multitudinous descriptions of the pains was by distinguishing between those in which there was (*a*) an accompanying sense of pressure or heaviness, (*b*) a dull ache defying further description, and (*c*) a sense of throbbing or bursting. The first two types occurred in people with a passive attitude to their problems, their whole outlook being that environmental conditions could not be altered, when stronger personalities would undoubtedly have sought active readjustment. The patients who had headaches of the bursting type were individuals with more conscious ambitions which they could not realise, often because they were in fact unsuitable. Women predominated in the first two types, men in the third. In view of the oft-repeated statement that functional headaches are "like something driven into the skull," it is interesting that only seven patients used this description, and only four said that their pain was "like a band around the head."

ONSET AND COURSE

The onset of a psychogenic headache is frequently forgotten. The disabling symptoms complained of at the hospital stage are often the result of an evolutionary process which started in a headache of simple and, we may add, unexplained worry. Persistence in tracking the condition to its source is desirable if many neuroses are not to remain unexplained. Many patients will not give relevant facts until they realise that we are seriously going to pursue them.

Trauma was found to be an essential factor in two cases:—

In one, a woman, it had been assumed that the cephalgia was the result of a maxillary sinusitis, from which it had certainly dated, though the picture was not quite typical. When a fuller history was pressed for it was suddenly remembered that the pain resembled that of an injury sustained in a struggle with an offended relative. With the revival of this memory and a full discussion of the less savoury details of the quarrel the headaches were relieved.

Trauma acted in a very different way in a man of 40 whose unsatisfactory management of his life was likely to precipitate some neurotic symptoms, though actually he had had none until eight years previously, when he had concussion after being hit on the head by a cricket ball. Although he quickly recovered from the concussion, the pain persisted and was not amenable to medicine or suggestion in any form. It provided a point of fixation for his resentment and an excuse for his ill-managed life.

These two cases illustrate an important point in prognosis, the elasticity of the patient's personality. The first patient, in spite of serious personal problems, was prepared to remould herself; in the second any real adjustment would have endangered the attractive but tinsel-like façade which he presented to the world.

The symptoms may be either continuous or variable, those which are continuous being less amenable to psychotherapy. Those with continuous pain were people whose whole orientation to life had been faulty and often childish, and who had never really faced the problems of maturity. Though such rigid individuals may be difficult to cure, it is not true that they cannot be helped at all, for some have stated that psychiatric interviews have made their pain more bearable. Those cases where the pain comes and goes, or where there is a continuous dull ache with acuter exacerbations, show fairly constant features. In general they are people who have at some stage been psychologically mature and have then regressed. Because maturity has been achieved they are more coöperative, they can grasp the working of cause and effect, and their prognosis is better.

Thus one man had headaches of unbearable intensity that occurred both at home and at work and made social contacts difficult. Great relief followed his discovering that they depended not upon the attitude of others to him but upon his shouldering excessive burdens in his home and his business. His pride delighted in this but his nature revolted against it. Rather than admit the impossibility of his load he had relied upon his symptoms to relieve him of the necessity of completing his tasks.

This condition reminds one of examination staleness, in which anorexia and lack of energy accompany headaches which may be vague or serious. It would be interesting to know whether true staleness ever affects those whose ambitions are reasonable and not a reaction to unconscious inferiority. Such headaches may be described as headaches of simple worry, and whether they persist will depend upon (*a*) the severity and persistence of the precipitating cause, and (*b*) the flexibility or rigidity of the personality affected.

In some cases a full history shows that an apparently hysterical cephalgia, by which is meant a single symptom with no other neurotic signs, is an episode, long or short, in the evolution of a neurotic illness. The importance of this is that if the single symptom is considered its origin is often obscure, or the most important mechanisms of the conflict are overlooked. Often a past or present anxiety-state or obsessional condition is hidden by the obtrusive importunity of the headache. Thus in a woman a headache of 18 months' duration followed a three years' history of an anxiety state, the origin of which it was not difficult to find in her husband's development of epilepsy after marriage.

The effects that their headaches had upon the patients could be roughly separated into four types:—

Group I.—The pain was prominent but apparently did not disturb the individual's life. The "belle indifference" of the hysteric was clearly evident.

Group II.—The pain limited the patient's activities and therefore caused considerable concern. In some the sort of activities which were limited suggested the underlying motive for the symptom.

Group III.—The headaches produced an attitude of annoyance rather than indifference or limitation of activity. It is likely that such resentment was projected upon the symptom instead of upon a current or past source of irritation which could frequently be traced.

Group IV.—The headache was associated with a sense of dis-ease, sometimes described as depression, sometimes as causing tiredness and worry, or the fear of illness and death. None of these accompanying symptoms reached obsessional intensity, and their continuous character and associations distinguished them from melancholia.

CAUSATION

The problem of why the cranium is the site of the pain requires consideration. Palpitations and gastric

disturbances in conditions of anxiety are referrable to the changes produced by emotion in the autonomic nervous system. If other physical symptoms of anxiety are attended by a physiological process giving rise to organ sensitivity, is such a process likely to be absent in cephalgias? According to Oppenheim cephalgia vasomotoria causes bursting headaches and anæmia those of the dull and heavy type. Despite the uncertainty that there is about the presence of vasomotor fibres round the intracranial vessels, the hypothesis that psychogenic cephalgia is associated with functional physical changes is more satisfying than hypotheses based upon such ideas as phallic symbolism. Once vascular changes have produced pain or discomfort apprehension is likely to cause these symptoms to continue. To forget the possibility of organic alterations is to encourage the canard that psychogenic pain is imaginary.

Previous trauma, as in all functional conditions, increases the liability of an organ to psychogenic symptoms, but only four of the present patients remembered any head injury.

The connexion in the lay mind between normal or abnormal mental function and the head seems to be a contributory cause of some people's symptoms. Neurotics as a whole are dimly aware that their minds are not working adequately. Some are acutely conscious of "lack of concentration" and others when pressed complain of preoccupation with images and ideas that they do not recognise as symptoms. They accept more readily than is often realised that all is not well with their mental outlook. On this basis some awareness of their heads stimulated by apprehension doubtless prolongs sensations which were at first produced by vasomotor change.

Mention must be made of the psycho-analytical statement that the head is a "well-known phallic symbol." The simpler proposition is to be preferred that to everyone, normal or abnormal, the head is a highly important part of the body, vying in this with the heart. Just as palpitations may excite the idea that the heart is seriously diseased and that life is endangered, so symptoms arising in the head, whether primarily caused by vasomotor changes or not, are a source of anxiety to the patient. Means of allaying this and the misconceptions connected with it are of first importance in preventing symptoms where the head is occupying too large a place in the individual's thoughts.

No consideration of psychogenic headaches would be complete without referring to the epinosic gain of the symptoms, for while this will not cause them it militates against their cure. By epinosic gain we mean the relief from stress that the patient obtains through the psychogenic symptom. It is the most serious barrier to emancipation from the symptom and, as we shall show later, it is an important consideration in prognosis. The epinosic gain may be seen when the symptom prevents the patient from facing difficulties, or affords a peg upon which repressed feelings of fear or resentment can be hung, as in the following cases:—

A man of 40 made successful attempts to gain promotion, but then found that this carried with it responsibilities that were a handicap rather than a relief. The onset of his symptoms coincided with rash attempts to compensate for his mistake. His pride prevented his accepting this, and the headaches saved his face.

Another suffered from headaches that he described as "being in the toils of hell," but he used precisely the same terms with regard to his employers in an absent-minded moment, and it was clear that the symptoms not only prevented his return to an environment which he regarded as unsatisfactory, but enabled him to express his real feelings about that environment in a roundabout way.

The neurotic symptom achieves an end—a paraplegia prevents a return to unwelcome duty, an agorophobia creates an invalidism and dependency upon others. A number of patients had themselves noted that their symptoms enabled them to escape from a difficulty, and others appreciated that there was such a connexion when it was explained to them. In these cases the commonest relief obtained was from distasteful work or society, from a new and obvious responsibility, or from some unpleasant train of thought. One patient could not face an engagement in his present state, another could not face professional training, and a third had to turn down an offer of new responsibility.

The relationship between cephalgia and the sexual life of the patient might seem a fruitful line of inquiry. In adolescents headaches sometimes follow masturbation, but none of the present cases were of this type alone. In some cases headaches followed normal intercourse and in others coitus interruptus, but often no headache followed either. No simple relationship between sexual life and symptoms could be found. The whole attitude of each individual to instinctual demands underlies the causation of the headache which follows or does not follow natural or unnatural stimulation of the sexual urge.

A formal description of particular types of pain in particular forms of neurosis seems to be impossible, but we can classify psychogenic headaches as follows:—

Type 1.—Headaches accompanying simple worry, readily recognised by patients as due to disquiet about current concerns.

Type 2.—Headaches incidental to anxiety states, in which cardiac, gastric, or other symptoms are prominent, depending upon: (*a*) the individual's personality; (*b*) severity of the precipitating cause and its associations; (*c*) the way the condition is dealt with; (*d*) the importance the patient attaches to his head. Where any one of these factors is unsatisfactory there is a likelihood that Type 3 will develop.

Type 3.—Chronic headaches, often of the pressure type, occurring especially in rigid individuals who show signs of emotional immaturity.

Type 4.—Headaches conforming to descriptions of hysterical pains, in that a single symptom is present without signs of anxiety or obsessional conditions, but in which a history reveals that the headache has been a substitute for these, or in which its disappearance is followed by the emergence of anxiety conditions.

Type 5.—True hysterical headaches, not preceded by other neurotic conditions.

PROGNOSIS AND TREATMENT

The prognosis of these cephalgias with out-patient treatment is partly explained by the factors (*a*), (*b*), (*c*), and (*d*) above, and by the suggested classification. The flexibility of the personality is the most important factor. The necessity for early and reasonable treatment in Types 1 and 2 is obvious. The prognosis in Type 3 is poor, since the patient is likely to have joined the ranks of professional sufferers, but gratifying results have followed attempts to make environmental adjustments. The work of the psychiatric social worker has been of much help here. In Type 4 the presence at some time of mental symptoms is an aid in approaching the patient and, though the prognosis is limited, a shift in symptoms

from hysterical pain to anxiety state, or vice versa, appears to occur alongside insight and approachability. The examples of Type 5 did not do well, in response either to suggestion or persuasion.

Length of history appeared to be less important than might be expected. One patient whose symptoms had lasted for 17 years recovered and remained well. It was clear that the epinosic gain afforded by the symptoms was a hindrance to recovery, and in the out-patient class of patient a further complication was the solicitude and lack of understanding of the relatives. Where the latter could grasp the state of affairs the results were often encouraging. Treatment in an out-patient department consists in obtaining an adequate history, discussing environmental strains, and reviewing the patient's capacity for adjustment. Extensive psychotherapy is not possible, but much relief is often afforded by methods which many would consider far from ideal.

I wish to thank Dr. George Riddoch and Dr. Russell Brain who referred these cases to me and have permitted me to publish them.

TREATMENT OF SCHIZOPHRENIA BY INDUCED CONVULSIONS

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On a visit to Budapest I was so much impressed by the good results obtained by Dr. Ladislaus von Meduna in the treatment of schizophrenia that I decided to try his method on my return to India. The treatment originates in Meduna's idea that there is a biological antagonism between schizophrenia and epilepsy, and consists in the induction of epileptiform fits by giving large doses of the water-soluble synthetic camphor preparation, Cardiazol (Knoll). The dose of this useful drug required for inducing epileptiform fits is far in excess of the dose usually prescribed in clinical practice, yet it has no injurious effect on the normal heart.

Meduna starts the treatment by giving intravenous injections of 0·5 g. of cardiazol in a 10 per cent. watery solution. This dosage usually suffices to induce epileptiform fits in patients, and it is not increased if it continues to induce the desired convulsions. On the other hand, if it fails, the dose is increased to 1·0 g. in 10 per cent. solution (i.e., 1·0 g. in 10 c.cm. of distilled water). Some schizophrenics have shown full remissions with three or four injections, and others have not improved at all after twenty or thirty. Meduna suggests that no case should be given up as hopeless before twenty convulsive shocks have been induced. The treatment is contra-indicated in cases of organic heart disease or acute fever.

AUTHOR'S EXPERIENCE

The Ranchi Indian Mental Hospital is the largest and one of the most modern mental hospitals of India. For the purpose of this experiment I selected 12 typical cases of schizophrenia, most of which had failed to respond to several forms of treatment. On the first day they were given intravenous injections of cardiazol 0·5 g. in 10 per cent. solution, and each had typical epileptiform fits.

All the patients were males, and they were treated in a separate ward. A routine examination of heart, urine, and blood pressure was made on the day before each injection. On the day of treatment (Mondays and Fridays) a cup of hot milk was given at 6 A.M. followed by the injection at 10 A.M. No food or drink was allowed for at least seven hours after the fit.

A typical fit.—Immediately after the injection the patient's eyelids begin to quiver, the face becomes highly anæmic, the body stiffens, and the patient makes a few irregular movements of hands and feet. He then loses consciousness and a typical tonic stage sets in. The hands are clenched, the wrist and elbows are slightly flexed, the arms are held to the sides, and the legs are extended; the back and the face become cyanosed. The patient at this stage never fails to open his mouth for a few seconds and this is the time to insert an improvised tampon to prevent the patient from biting his tongue. The tampon is made 6 in. long and ¾ in. thick. Within a few seconds the clonic stage starts with irregular jerks and spasms. During this phase some patients pass urine and some ejaculate, with or without erection. At the end of the clonic stage the patient goes into a deep coma-like sleep which lasts for a few seconds. He then regains consciousness, but at first he appears to be confused and dazed and it is better to let him sleep and not to disturb him with questions. No one is allowed to leave the bed for at least 5–6 hours after the fit.

Variations in response.—The length of the tonic and clonic stages varied and we noted that patients with a strong prolonged clonic response eventually derived much benefit from the treatment. Two of the patients were always excited for a few hours after the injection, but at night they slept well without hypnotics; two others were hilarious for about half an hour. A katatonic, with marked flexibilitas cerea and mutism, on the day of the fifth injection implored us not to give him the treatment and said he would act and behave like a normal person in every way.

TWELVE CASES OF SCHIZOPHRENIA TREATED WITH CARDIAZOL (ALL MALES)

Ser. No.	Type.	Stay in hospital before treatment (years).	Injections.	Result.
1	Katatonic.	4	7 of 0·5 g. 13 „ 1·0 g.	Discharged as recovered.
2	Hebephrenic.	1	11 of 0·5 g.	Recovered. Resumed duties as clerk.
3	Katatonic.	1	8 of 0·5 g. 5 „ 1·0 g.	Discharged as recovered.
4	Hebephrenic.	½	8 of 0·5 g. 12 „ 1·0 g.	Much improved: fit for work.*
5	Katatonic.	1	7 of 0·5 g. 13 „ 1·0 g.	Much improved: fit for work.*
6	Hebephrenic.	4	11 of 0·5 g. 9 „ 1·0 g.	Much improved: fit for work.*
7	Katatonic.	4	9 of 0·5 g. 11 „ 1·0 g.	Much improved: fit for work.*
8	„	½	9 of 0·5 g. 11 „ 1·0 g.	No improvement.
9	„	½	9 of 0·5 g. 11 „ 1·0 g.	„ „
10	Paranoid.	11½	7 of 0·5 g. 13 „ 1·0 g.	„ „
11	Katatonic.	2	6 of 0·5 g. 14 „ 1·0 g.	„ „
12	„	6	10 of 0·5 g. 10 „ 1·0 g.	„ „

* This means that the patients were able to work in the occupational therapy departments of the hospital.

I gave him a chance and he behaved very well for two days but relapsed on the third. The treatment was then continued and after a full course he showed great improvement in his katatonic condition.

Dangers and complications.—No case showed any dangerous symptom. One patient during a fit sustained a dislocation of the left shoulder which was soon put right and did not recur. It is said that any hypnotic, especially morphia, hyoscine, and paraldehyde, will counteract symptoms produced by cardiazol, but though these were always kept ready for immediate use we never had any occasion to use them.

The accompanying Table gives particulars of the cases.

SUMMARY AND CONCLUSIONS

Of 12 typical cases of schizophrenia treated with cardiazol according to Meduna's method 3 were discharged, showing full remissions, 4 were greatly improved and now lead a useful life in the hospital, practically attaining a "social remission," and 5 remained stationary. No dangerous symptoms developed, and the method has the advantage over insulin therapy that it does not require the same continuous care from doctors and nurses.

I am indebted to Messrs. A. G. Knoll for a supply of cardiazol powder.

A COMPARISON OF INSULIN AND CARDIAZOL CONVULSION THERAPIES IN THE TREATMENT OF SCHIZOPHRENIA

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Insulin treatment was established in 1933 by Sakel in Vienna, and Cardiazol convulsion treatment in 1934 by Meduna in Budapest. Insulin treatment was introduced into Great Britain early in 1936 by me, and cardiazol treatment a year later by L. C. Cook. Since both methods are finding increasing use in this country, a brief survey of their relative advantages and disadvantages, with respect to recent practical applications, may be useful.

Up to last May, when an international conference on insulin and cardiazol therapy was held in Switzerland, over 2000 patients had been treated with insulin hypoglycæmia all over the world, and over 600 with cardiazol convulsions, including a fair number in this country. The techniques of the two methods have been fully described by Isabel Wilson (1936) and Kennedy (1937), and only recent modifications, such as their combination, need be discussed here. Results are classified according to the four categories established by Müller (as set out by James, Freudenberg, and Cannon 1937)—namely, (1) complete remission, (2) incomplete remission, (3) partial remission, and (4) no improvement.

DEMANDS UPON TIME

An undoubted advantage of cardiazol treatment is the great saving of time; also its management is less exacting. Convulsions are induced two or three times a week, and as the whole process does not take more than five minutes of the doctor's time, he, with the aid of two or three nurses, can treat 40 to 50 patients in one morning. Insulin treatment is given six times a week, each treatment lasting about five hours from beginning to end, during which the doctor must not leave the patients. With the aid of two or three nurses, one doctor can treat 8–10 patients in one morning.

The after-treatment necessitates a similar amount of work with both methods, except that with insulin the nurses must be capable of dealing with after-shock, should it appear (Hamilton 1937). Both treatments should be accompanied by psychotherapeutic encouragement and by occupation therapy. The duration of the whole course of treatment is roughly the same; cardiazol requires an average of 6–8 weeks and insulin 8–10 weeks.

ADJUSTABILITY TO CLINICAL REQUIREMENTS

Although the more lengthy and exacting procedure, insulin treatment has the advantage that it can be adjusted to any degree from mild hypoglycæmia to deep coma; cardiazol convulsions are not adjustable, and only the number induced is subject to control. Contrary to expectation, the biochemical changes produced by the two methods have much in common; the effects of cardiazol, however, are fully spent in a minute, whereas those of insulin extend over hours. Thus the element of shock does not predominate in insulin treatment; quite a number of patients recover without the necessity of reaching the coma stage, and the gradual mental "unfolding" which takes place during hypoglycæmia—layer by layer so to speak, as witnessed by lucidity and increasing insight—shows the unique therapeutic possibilities of insulin treatment.

Since the depth and duration of hypoglycæmia, and the time and method of terminating it, can be suited to clinical requirements, insulin affords a wide therapeutic range, and different techniques are in use according to the clinical type of schizophrenia (Sakel 1936).

MORTALITY-RATE, COMPLICATIONS, CONTRA-INDICATIONS

In the hands of the experienced, the mortality-rate of the two treatments is equally low. It was 1 per cent. among the first 700 insulin patients, and 0·5 per cent. among the first 600 cardiazol patients, but with accumulating experience it fell to 0·4 per cent. among 500 patients recently treated in Switzerland (Müller 1937). There is less likelihood of emergencies arising with cardiazol than with insulin hypoglycæmia, where laryngeal spasm, failure to awake from coma, or cardiovascular collapse may be encountered. Cardiazol is more unpleasant to the patients, but their apprehension can be alleviated by giving, 30–45 minutes before the injection, morphine sulph. gr. 3/8, hyoscine hydrobrom. gr. 3/200, and atropine sulph. gr. 1/100 (Cook 1938). I prefer premedication with insulin, referred to later, which completely eliminates unpleasantness.

The contra-indications—namely, any form of cardiovascular disease, as well as respiratory, renal, or hepatic disease—are the same for both treatments. So are their principal after-effects (occasional vomiting or transient attacks of tachycardia). Passing alterations of the T wave appear to be more common with insulin while with cardiazol luxation of the jaw or arm has been known to happen.

The fact that most patients gain weight while undergoing either form of treatment shows that there is no detrimental effect on their general health.

The question whether or not hypoglycæmia and induced convulsions are as harmless to the brain as clinical observation suggests, remains an open one, but the results of recent animal experiments are reassuring in respect of hypoglycæmia (Schmid 1937) as well as of induced convulsions (Stender 1937).

PERMANENCE OF BENEFIT AND INCIDENCE OF RELAPSE

As regards permanence, treatment is too recent to admit of far-reaching deductions; however, a high proportion of the recoveries obtained in Vienna and Budapest four and three years ago, when treatment was begun, have been maintained. It is difficult to differentiate between the incidence of relapse of the two methods, for only one reference regarding cardiazol has been published. Angyal and Gyárfás (1936), treating 44 patients with cardiazol, obtained 17 complete or incomplete remissions and report 4 relapses (23 per cent.). With insulin Frostig (1937) treating 53 patients (27 complete remissions) had 4 relapses (15 per cent.). Béno (1937) treating 49 patients (35 complete, incomplete, or partial remissions) had 5 relapses (14 per cent.), while Müller, surveying 495 Swiss patients (200 complete or incomplete remissions), noticed 13 relapses, which is only 6·5 per cent.

It should be pointed out that with either method, poor results or relapses may be often due to the technical error of not giving a long enough course of treatment.

REACTION OF CLINICAL TYPES OF SCHIZOPHRENIA TO THE METHODS

The methods are not equally effective with all types of schizophrenia. Hebephrenia and dementia simplex both give relatively poor response to either method; in the other types the order of improvement with cardiazol is generally inversely that with insulin. For example, catatonic excitement and paranoid types are more responsive to insulin, whereas stupor responds better to cardiazol. This is of practical importance and shows the value of combining or of alternating the two methods, since patients proving refractory to cardiazol may readily respond to insulin and vice versa. Angyal and Gyárfás, by supplementing the treatment of those refractory to cardiazol by a period of insulin, found their remission-rate increased from 44 per cent. to 63 per cent.

COMBINED INSULIN-CARDIAZOL THERAPY

The method recently evolved by Georgi (1937) has the advantage that, for biochemical reasons, convulsions can be produced with a smaller dose of cardiazol (on the average 3 c.cm.), and, as the patient has no recollection of the process, the unpleasantness of the treatment is completely overcome. It should be clearly understood that cardiazol is given during the early stage of hypoglycæmia, well in advance of coma.

The technique is as follows. A full dose of insulin is given and coma would normally follow in 4–5 hours, but at the end of about 1½ hours, when the patient is somnolent, cardiazol is injected. After the fit, patients come round and are able to drink sugared tea, which terminates the hypoglycæmia. Insulin can either be given on six days of the week, convulsions being induced on the 2nd, 4th, and 6th days, or insulin (followed by cardiazol) is given on two or three days of the week only.

In my opinion this combination is particularly safe, because the early stage of hypoglycæmia employed is free from the possible complications of insulin therapy and the resulting increased susceptibility to convulsions reduces the dose of cardiazol.

SUITABILITY OF CASES FOR INDUCTION OF CONVULSIONS

Convulsions are a valuable adjunct during the ordinary course of insulin treatment, but they must not be indiscriminately induced. There have been instances of regression after them, but the contra-indications cannot as yet be formulated. Convulsions are indicated in cases which after a promising start show no further progress, and in stuporose patients generally.

Neither method is necessarily confined to the treatment of schizophrenia, both finding other psychiatric applications, and the calming effect of hypoglycæmia or of induced convulsions has been described as life-saving when used on acutely excited patients. Hypoglycæmia has been used in combating the withdrawal symptoms of drug addicts (Sakel 1933), and cardiazol convulsions to dispel or curtail the "psychic equivalents" of epilepsy (Baldauf 1937).

LIMITATIONS OF TREATMENT

The results obtainable with insulin and with cardiazol largely depend on the duration of illness. In the first year the proportion of complete and incomplete remissions is, with either method, about 60 per cent. (assuming an adequately long course of treatment with appropriate psychotherapeutic encouragement). This high proportion of recoveries, however, becomes rapidly less, with either method, as the duration of illness appreciably exceeds one year (see Tables I and II). For the second year, results are about half those of the first year, and for the third and subsequent years they are again progressively halved. This does not mean that it is unusual to obtain remissions in long-standing cases; Briner (1937) using cardiazol reports 9 per cent. complete or incomplete remissions in 54 cases of over five years' duration. It must be realised, however, that after a certain duration of illness good results can be expected only in a minority of cases, and early treatment is essential.

While convinced that insulin has the greater therapeutic possibilities, I would recommend that in long-standing cases the less expensive and time-consuming cardiazol therapy should first be tried.

SYNOPSIS OF RESULTS

Results reported with the two treatments are set out in Tables I and II. Table I may be regarded as representative of the results of insulin, since technique, diagnosis, and assessment are similar in all cases. In order to present a general survey of results with cardiazol, I had to group together the results of Meduna (110 patients), Briner (111), and of Angyal and Gyárfás (44). (Unfortunately, Meduna only distinguished between the remitted and the unimproved, and Angyal and Gyárfás's classification as to the duration of illness is not identical with the other two.) As long-standing cases predominate in Table II, the Tables are not strictly comparable, with the possible exception of the percentages in the last two columns, which do not show much variation of figures. Of especial importance, however, is the fact that the results of either treatment significantly surpass the average proportion of recoveries in untreated patients.

The insulin and cardiazol cases taken together (irrespective of their duration) show complete or incomplete remission in 40 per cent. and 37 per cent. respectively, whilst a general survey of spontaneous remission figures shows that of a total of 2460 patients, 23·6 per cent. were reported at home well or improved (Pullar Strecker 1938).

An economic fact of great importance is that the average stay in hospital is much reduced both by insulin (Dussik 1936) and cardiazol treatment (Cook). Another observation is that recovery after these methods, as judged by insight and contact obtainable, is more complete than in spontaneous remission.

TABLE I—INSULIN TREATMENT

(after Müller)

Duration of illness in years.	No. of cases.	Complete and incomplete remission.	Complete, incomplete, and partial remission.	Unimproved.
		No. and per cent.	No. and per cent.	No. and per cent.
Under 1 ..	283	162 (57·2)	222 (78·4)	61 (21·6)
„ 2 ..	88	24 (27·3)	54 (61·4)	34 (38·6)
Over 2 ..	124	14 (11·3)	54 (43·5)	70 (56·5)
Total ..	495	200 (40·4)	330 (66·7)	165 (33·3)

TABLE II—CARDIAZOL CONVULSION TREATMENT

(after Meduna, Briner, and Angyal and Gyárfás)

Under 1 ..	103	71 (69·0)	82 (79·7)	21 (20·3)
1 to 5 ..	75	19 (25·4)	36 (48·0)	39 (52·0)
Over 5 ..	87	9 (10·3)	38 (43·5)	49 (56·5)
Total ..	265	99 (37·4)	156 (58·9)	109 (41·1)

CONCLUSION

The results obtained with insulin and cardiazol convulsions in the first years of illness show that they constitute a decided advance in the treatment of schizophrenia. It would be a mistake to neglect either method, or to practise one to the exclusion of the other. Both have their clinical indications and they can be selected according to the technical facilities available. A combination should be attempted wherever suitable, and their alternate use is recommended in refractory cases.

I wish to thank Prof. D. K. Henderson of the Edinburgh Royal Mental Hospital, where insulin treatment received its first trial in Great Britain, and the Medical Research Council, who supported this work by a grant.

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CLINICAL AND LABORATORY NOTES

THE ACTION OF TESTOSTERONE PROPIONATE ON THE UTERUS AND BREAST

BY ALFRED A. LOESER, M.D. Berlin, L.R.C.P. Edin.

BY experiments on female monkeys Zuckerman (1937) has shown that testosterone propionate can be used to inhibit the ripening of ovarian follicles. Cotte, Martin, and Mankiewicz (1937) have proved that it has a similar action in the rabbit. My own experiments with this hormone in gynæcological diseases began independently in April, 1937, and fourteen patients have so far been treated.

Five of these suffered from menorrhagia (10–14 days' loss at each period) probably caused by small intramural fibromyomas. Before treatment started a curettage was performed and the endometrium on histological examination was found to be in various stages of a normal menstrual cycle. In these five cases the curettage led to no change in the quantity or duration of the loss at the next period, and injections of testosterone propionate were accordingly commenced. Doses of 50 mg. intramuscularly were given on alternate days for two weeks and longer, and it was found that a total dosage of about 300 mg. postponed the period about 8–10 days. The menstrual flow was scantier and it lasted a shorter time. With doses totalling 500 mg. or more, menstruation was missed out altogether, and in a case thus treated curettage showed an endometrium that was completely atrophic. When treatment was continued the menstrual period did not return, and during this functional rest, in which the uterus received no stimulation by female hormones, the fibromyomas decreased in size. Clinical examination revealed a distinct shrinkage, though they never actually disappeared. When the injections were discontinued menstruation returned after 6–10 weeks.

Five other cases of menorrhagia, in which the cause was unknown, reacted to testosterone propionate in similar fashion. Small doses delayed the menstruation; larger total doses of 500 mg. or more brought about atrophy of the endometrium. One case of metrorrhagia deserves special mention.

Miss A, aged 30, had suffered for years from irregular menstruation, often of three weeks' duration. The uterus was soft but otherwise normal; the left ovary was distinctly enlarged. Curettage showed hyperplasia (Fig. 1). The next period had the same character as before and lasted twelve days. Injections of altogether 500 mg. testosterone propionate were then given within the next four weeks, and twenty-eight days after the last period curettage showed an atrophic endometrium (Fig. 2).

In all these ten patients I had to treat pathological menstrual hæmorrhages. The next two patients had normal periods but suffered from chronic mastitis. Turpault (1937) and Desmarest and Capitain (1937) report that this condition is favourably influenced by testosterone propionate, and my very limited experience agrees with theirs.

Miss B, aged 24, noticed a lump the size of a pigeon's egg in the left breast. Injections totalling 180 mg. of testosterone propionate were given and menstruation was inhibited. Six weeks after the last

normal period a curettage was performed, and the endometrium was found to be in a premenstrual stage, corresponding to the third week of a normal cycle. Meanwhile the lump in the breast had decreased in size. Menstruation set in seven weeks after the last normal period. Further injections of testosterone propionate (600 mg.) were given, and four weeks after these injections curettage was again performed. The endometrium was atrophic and all the lumps in the breast had disappeared.

Generally, twelve injections of 50 mg. or six injections of 100 mg. were administered within three or four

1 2

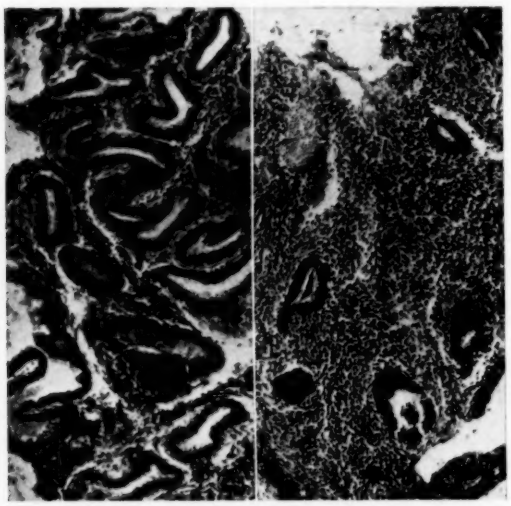

FIG. 1.—Endometrium from fundus of uterus before treatment showing hyperplasia.

FIG. 2.—Endometrium from fundus of uterus after total dose of 500 mg. of testosterone propionate.

weeks. No harm whatever was caused by these injections, even when given for seven months up to a total of 1500 mg.

In two cases of dysmenorrhœa excellent results were obtained after the injection of 150 mg. only.

CONCLUSIONS

Suitable doses of testosterone propionate can be used to induce atrophy of a normally functioning endometrium, or even of an endometrium in a pathological state resulting from stimulation by too much œstrin. This action could be explained by supposing that it prevents the ovarian follicle from ripening—perhaps by inhibiting the effective secretion of gonadotropic hormone by the anterior lobe of the pituitary gland. The results recorded suggest that it may be possible to direct and regulate ripening of the follicles by giving appropriate doses of testosterone propionate, and also that this substance will be useful in the treatment of chronic mastitis.

I am indebted to Dr. John Oliver of St. Thomas's Hospital for his histological examinations.

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CARCINOMA OF PANCREAS

WITH SECONDARY INVOLVEMENT OF LUNG SIMULATING ACUTE PLEURISY

By John Mackay, M.D. Glasg., D.P.M.
ASSISTANT MEDICAL OFFICER AT THE COUNTY MENTAL HOSPITAL, WHITTINGHAM, LANCS

A man aged 69 had been an inmate of the County Mental Hospital, Whittingham, since 1901. He had maintained fair bodily health until August, 1937. At the end of that month he complained of a feeling of tiredness. He was put to bed but was allowed up on Sept. 5th.

On Sept. 27th he again complained of not feeling well. His temperature was 100·6° F. In a few days time there were definite signs of pleural effusion on the left side and the temperature remained elevated. Examination of the sputum was negative for tubercle bacillus, but pneumococci were found together with mixed organisms. On Oct. 11th cardiac embarrassment was so pronounced that it was decided to aspirate; 9 oz. of pleuritic fluid was removed. This was not blood-stained. His condition showed a little improvement and on Oct. 13th Prontosil treatment was begun. This was given in 15-grain doses thrice daily. The temperature gradually subsided and after Oct. 17th it remained normal or subnormal with the exception of a very occasional slight evening rise. During November improvement was maintained, although it was still possible to demonstrate the presence of fluid in the chest. About the middle of December a change was noted in the patient's condition. Signs of heart failure appeared and he gradually became weaker. He died on Dec. 20th.

Post-mortem examination.—The heart muscle was degenerated and the mitral and tricuspid valves were thickened. The aorta showed patches of atheroma. The right lung was congested. The left lung was also congested and the left pleural sac contained about 7 oz. of fluid. At the root of the left lung there was a new growth about 3 in. in all diameters. Despite the fact that it surrounded the vital structures entering the organ, it did not appear to have interfered with their function. The other organs showed no manifest disease with the exception of the pancreas which was the seat of an extensive primary growth. A few mesenteric glands were carcinomatous.

The case is interesting for the following reasons: (1) The onset of an "acute pleurisy" with elevation of temperature and subsequent defervescence and apparent improvement in the condition of the patient. (2) Despite the growth in the lung there were no pressure signs. (3) The primary neoplasm in the pancreas was unaccompanied by compression of the bile-duct, hence jaundice was absent. (4) The patient showed little or no emaciation.

I have to thank Dr. A. R. Grant, medical superintendent, for his interest in this case and for his permission to publish the details.

West London Hospital: Rheumatism Clinic.—The new clinic formed for the treatment of chronic rheumatic diseases at this hospital was officially opened on Feb. 2nd, when a short lecture was given by Dr. W. S. C. Copeman, the physician-in-charge, who showed a film of his own making illustrating the differential diagnosis of rheumatoid and osteo-arthritis. He drew attention to the importance of chronic rheumatism as an industrial disease which cost the country more than any of the better known maladies, such as tuberculosis, upon which much public money is spent. He believed that the West London Hospital was the first general hospital in London, if not in the British Isles, to start a special department for the treatment and investigation of these diseases.

Other speakers included Dr. Maurice Shaw (dean of the medical school), Dr. James Fenton (medical officer of health for Kensington), Dr. J. B. Howell (medical officer of health for Hammersmith), and Lieut-Colonel J. E. McGwire (chairman of the Kensington public health committee).

MEDICAL SOCIETIES

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this society held on Jan. 27th, with Dr. E. G. BARK, the president, in the chair, Mr. PHILIP HAWE read a paper on the

Treatment of Undescended Testis

He said that although in the past spontaneous late descent had been thought unlikely after the age of 3, recent statistics supported the view that in about four cases out of five the testis descended spontaneously by the age of puberty. A proportion of cases that otherwise require surgical treatment responded to injection therapy with gonadotropic hormones. This usually failed to secure descent, if there was an associated hernia and hydrocele, but a preliminary course of injections increased the size and vascularity of the testis and the development of the scrotum, and thereby improved the prospects of operation. Post-operatively also the hormones were of value. In bilateral cases injections should be begun at about the age of 6, except in the minor types. Unilateral cases should be considered individually. In those that needed operation he recommended the Ombrédanne and Thorek methods.

The PRESIDENT said that he considered many years must elapse before the dangers of over-stimulation by sexual hormones in growing children could be correctly assessed.

Mr. COSBIE ROSS discussed the results of endocrine therapy. He pointed out that the method had been used for a longer period in some American hospitals, and quoted Campbell as saying that while congestive enlargement of the testicle and full descent might occur as a result of a course of injections, in many cases the testicle had returned to its former site and had resumed its previous size a few months later. This appeared to indicate that hormone therapy should be used as an adjuvant to surgical measures, and he considered that the best time for operation was when hormone therapy had achieved its maximal effect. The importance of operative correction of bilateral cases had been emphasised by Moore's experiments in which the normal descended testicle of an animal was transplanted back into the abdomen and some time later was shown to have lost all spermatogenesis. This was due to the increased temperature in the abdomen and emphasised the important thermal function of the scrotum, which acted as a "testicular radiator." Mr. Ross considered that bilateral cases should be operated upon before the age of 8. Puberal changes were already in progress, and if the full physiological effect of the operation was to be obtained, it should be performed before these changes began. In unilateral cases he was prepared to wait until puberty. In conclusion, Mr. Ross said that the whole question of the treatment of undescended testicle was overshadowed by the hernia that was present in the majority, when neither endocrine therapy nor procrastination was justifiable.

Dr. JOHN D. HAY asked if the increased virilism and enlargement of genitals produced in some of the cases by injections of gonadotropic hormone persisted after the cessation of the injections.

Dr. A. G. C. FFOLLIOTT described two patients, the first a boy with a testis high up in the left inguinal canal that descended spontaneously at the age of 18, and the second a boy aged 7 with bilateral undescended testes high up in the inguinal canal, with severe symptoms of dystrophia adiposa genitalis, which responded to a course of gonadotropic injections twice weekly; the left testicle descended after the sixth injection, and the right after the tenth.

Mr. W. A. THOMPSON considered the treatment of undescended testes so important that it demanded closer observation and more careful recording by those who dealt with it in large numbers. He had seen over 400 patients, and had operated on 271. In his cases 1 in 9 were bilateral; 40 per cent. descended of their own accord, and this descent occurred during the first two years in 5 per cent., from 2–5 in 10 per cent., from 5–10 over 15 per cent., and from 10 onwards under 10 per cent. Hernia was found to be associated in only 35 per cent. It appeared that torsion was not seen so often now as formerly, possibly because these patients were under supervision and because pain in an undescended testicle is regarded as a partial torsion and an indication for operation. The presence of a hernia also called for surgery. His practice now was to operate at the age of 10, thus permitting a third of the cases to descend and in the others anticipating the physical and physiological changes of puberty. In over two-thirds there were uniformly good results clinically. In 10 per cent. the testicle had to be removed, and in another 10 per cent. the testicle atrophied. The remaining results could only be described as moderate. He had been disappointed and frightened at the results of hormone injections; they appeared to require serious consideration in relation to the future state of the patient.

Stillbirth and Neonatal Death

Mr. BRYAN WILLIAMS contributed some observations on a series of cases of stillbirth and neonatal death. He pointed out that the total loss of life from abortions, stillbirths, and neonatal deaths was enormous, and yet relatively slight attention was paid to it compared with that given to maternal mortality. In this country, however, several investigations had been made, starting with the classical and very valuable work of Spencer.

There seemed to be no object in separating the neonatal deaths that came under the observation of the obstetrician from stillbirths, since the same factors were responsible for both. Classification provided a difficulty, and no method was free from disadvantages, but he had endeavoured as far as possible to determine the primary cause of fœtal death. For this purpose, he had taken a series of 538 cases, which represented all the stillbirths and the great majority of the neonatal deaths that had occurred in Walton Hospital during 1936 and 1937. Post-mortem examination, for which his colleague Dr. R. Y. Dawbarn was responsible, had been carried out in 63 per cent. of these cases. Toxæmia was the biggest factor, and accounted for a quarter of all fœtal deaths. In patients with recurrent toxæmia, or in multigravidæ who developed a tendency to toxæmia after a series of normal pregnancies, the fœtal mortality was extremely high. Complications of labour provided a fifth of the deaths. Among these, cord complications were the most frequent. Cerebral hæmorrhage was also an important cause, and was found most often after normal delivery and least often after low forceps delivery, which was an extremely safe procedure from the point of view of the fœtus. Congenital abnormalities accounted for over an eighth, and of these, over a half were cases of hydrocephalus, anencephaly or spina bifida.

Prematurity was the cause of death in a tenth of the cases, though this figure was higher in a general hospital admitting non-obstetrical complications of pregnancy and the puerperium than in a purely maternity hospital. Other conditions responsible included placental conditions, infections, multiple pregnancy, and hæmorrhagic disease. Syphilis at the present day seemed to be a rare cause of fœtal death, and was only found in 1 per cent. A few cases had been grouped under the heading of "low pregnancy threshold." In these, there was a considerable tendency in successive pregnancies for abortion, stillbirth or premature labour to occur without apparent cause. In reviewing these cases, there seemed very little that could be done in the light of present knowledge to reduce fœtal mortality appreciably. Improved standards in the conduct of labour could prevent some deaths, but it was mainly to the pædiatrician that they should look for help. The methods used to prevent infection in the mother during labour and the puerperium should also be applied in the case of the new-born, and an increased practice of breast-feeding would doubtless save many lives.

Dr. H. M. DUVALL showed a table summarising the causes of neonatal deaths and stillbirths occurring in the Liverpool Maternity Hospital in 1936, taken from the report. The total infant mortality-rate for 2094 births was 9·6 per cent., and the neonatal mortality-rate for 1947 live births was 2·8 per cent. Obstetrical difficulties and complications of labour accounted for 34·8 per cent., with toxæmias of pregnancy 26·6 per cent., gross fœtal malformation 12·8 per cent., no apparent maternal or fœtal cause (stillbirths only) 9·8 per cent., and chronic maternal disease, infections, prematurity, atelectasis, and asphyxia for the remaining 16 per cent. These figures showed a fairly close agreement with Mr. Williams's figures for Walton Hospital.

Miss R. NICHOLSON considered the great decrease of stillbirths due to syphilis, from the post-war figure of a third of all causes to the present low rate, was universal and due to the early and thorough treatment of pregnant women suffering from the disease. She thought that in toxæmic cases the lives of some infants might be saved by the artificial rupture of the membranes in patients who continued to have a high blood pressure in spite of treatment.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY

THE annual general meeting was held on Jan. 27th, with Dr. ROBERT SCOTT, the president, in the chair.

Radiology of Renal Tumours

Dr. HUMPHREY FOY discussed the rôle of radiology in the early diagnosis and treatment of hypernephroma and other renal tumours. Hypernephromata, now regarded as malignant adenomata originating from the renal tubules, typically arise from the upper pole of the kidney, immediately below the capsule. Thus a palpable loin tumour, though a cardinal physical sign, may be by no means an early one. Hæmaturia, another cardinal sign, does not occur until the tumour bursts its capsule and invades the kidney substance. Once the renal veins are invaded emboli are apt to follow quickly in the lungs and bones where metastases should as far as possible be radiologically excluded before operation is contemplated. The value of intravenous pyelography in these cases is not only to show abnormalities in the suspected kidney, but also to demonstrate the normality of the other kidney.

A man, aged 40, with a fortnight's history of transient pyrexia, hæmaturia and loin pain was found to have a vague mass in the right loin. A simple radiogram proved the swelling in the loin to be an enlarged right kidney. Intravenous pyelography showed that the enlargement chiefly affected the lower pole, that the upper and middle calyces and pelvis outlined satisfactorily but showed early dilatation, and that the lower calyx was missing. There was a pressure deformity along the lower border of the renal pelvis, and the part of the ureter in contact with the inner border of the kidney was also compressed by the expanding lower pole. The left kidney was perhaps slightly enlarged but otherwise normal. A diagnosis of hypernephroma was made, nephrectomy was performed by Mr. Wayland Smith, and the diagnosis was histologically confirmed by Dr. W. A. Robb.

Fifty per cent. or more of hypernephromata when first seen are too large to be operable, but being sensitive to irradiation may be so reduced in size as to be made operable. Post-operative irradiation also, in the hope of sterilising the surrounding tissues, is a therapeutic measure which should not be neglected.

In the ensuing discussion Mr. ALAN GAIRDNER said that intravenous should always be supplemented by retrograde pyelography, for thus only could obstruction in the calyces be satisfactorily demonstrated. By relying solely upon the intravenous method a false impression might be gained because the calyces do not fill and empty simultaneously.

SOUTHERN MEDICAL SOCIETY, GLASGOW

AT a meeting of this society on Jan. 27th Dr. JAMES F. BRAILSFORD (Birmingham) read a paper on

Paget's Disease of Bone

The clinical picture drawn by Paget in 1876 was, he said, so complete that though numerous observers had seen many more cases their descriptions added little. Dr. Brailsford gave the following analysis of the findings in 154 patients (82 males and 72 females) he had examined:—

Age Periods

20–30	30–40	40–50	50–60	60–70	70–80	80+
1	5	24	53	53	13	5

Youngest 27. Oldest 87.

Site First Discovered

Pelvis.	Tibia.	Femur.	Head.	Spine.	Humerus.	Os calcis.
58	37	22	13	13	8	3

Fractures

Tibia.	Femur.	Humerus.	Pelvis.	
7	8	5	3	Total 23

Malignant Changes

Pelvis.	Tibia.	Femur.	Scapula.	Spine.	
2	1	1	1	1	Total 6

The majority had no distinctive clinical features: the condition was discovered accidentally during radiographic examination of the spine or pelvis of patients who complained of pain or discomfort or who were suffering from a spontaneous fracture. Only patients with a bowed tibia were suspected clinically of suffering from the disease, and when the skeleton of these was radiographed other isolated bones showed further evidence. The affected bone is expanded and plastic, and the lesions fall into three groups: (1) those showing decalcification, (2) those

showing a general increase in density, and (3) those showing fusion and increased density and thickness of the peripheral and main trabeculæ in which lanceolate, ovoid, or rounded areas resembling bone cysts are apparent. The disease seems to begin either in the endosteal or periosteal tissue. When it begins in the latter the periosteum appears to be stripped from the bone by a deposit of osteoid tissue between it and the cortex. Only in that segment of the bone from which the periosteum has been stripped does decalcification and absorption of the original shaft occur; therefore the bone with intact periosteum has normal outlines, density, and structure. There is a clear V-shaped line of demarcation between the shaft of the normal and the diseased bone. In the acute phase with decalcification spontaneous fracture is common; later calcium is deposited and the tendency to fracture, though present, is much reduced. The fractures heal readily. Malignant metaplasia may occur after as short a period as 3–4 years or as long a period as 30–40 years. This complication readily becomes apparent clinically and radiograms indicate either a tumour of the periosteal tissue, with little or no change in the bone, or an endosteal lesion. Metastases appear in similar sites rather than in the viscera.

The following lesions, said Dr. Brailsford, have radiographic features resembling those of Paget's disease: (*a*) carcinomatous infiltration of the bones from a primary in the prostate, stomach, or œsophagus; (*b*) chronic fluoride poisoning; (*c*) marble bones (Albers-Schönberg disease); (*d*) angioma; (*e*) chronic inflammatory processes; and (*f*) Ewing's tumour.

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on Feb. 2nd, with Prof. G. GREY TURNER, the president, in the chair, a discussion was held on the treatment of

Acute Streptococcal Infections

Dr. S. C. DYKE (Wolverhampton) said that as infections by non-hæmolytic streptococci were but rarely acute and their treatment had altered little in the last century, he would speak only of the hæmolytic organisms. Until two years ago infection by them had been one of the most dreaded and dangerous of ills and treatment had resolved itself principally into the time-honoured measures of rest and heat; these two remained as important to-day, although the introduction of the sulphanilamide group of drugs had completely altered the outlook. The discovery of these compounds might be claimed as a triumph for scientific method in so far as it resulted from chemotherapeutic research. The original investigator, Domagk, had put a red dye on the market for its antibacterial action and it had remained for the Tréfouëls in France and G. A. H. Buttle in England and their co-workers to show that a particular component of the dye was effective. The statistics produced by L. Colebrook and his co-workers at Queen Charlotte's Hospital left no doubt of the effectiveness of the sulphanilamide compounds in the treatment of puerperal sepsis. There were, however, no comparable data for its effect in the treatment of cellulitis, lymphangitis, and other acute infections usually regarded as surgical. This was probably because in nearly every hospital the laboratory service was ancillary to, rather than an integral part of, clinical work. Nevertheless the efficacy of these drugs in infections other than puerperal fever was also undoubted.

Although sulphanilamide was only sparingly soluble in water it was quickly absorbed from the intestinal tract. It was apparently as effective when given by the mouth as when given by injection, and it should therefore be swallowed except when some reason like persistent vomiting made that impossible. To taste it was to understand the phrase "dust and ashes in the mouth," but this seemed a minor inconvenience when an American experience of attempts to make a palatable liquid preparation was borne in mind.

The first untoward symptom which had been noted after taking sulphanilamide was the formation of sulphæmoglobinæmia and methæmoglobinæmia with the rapid development of a blue look. The peculiar thing was that the patient's general condition was usually not affected for the worse unless he was already anæmic; then the extra withdrawal of hæmoglobin from circulation might lead to sighing respiration and breathlessness. This was relieved by a small transfusion. Pyrexia was also known to occur 7–10 days after the first administration of the drug and was sometimes accompanied by a rash; this was readily distinguished from measles as it was more like measles than any measles rash. The nausea that some patients experienced after each dose was not an indication for cessation of treatment. Dr. Dyke thought that the drug's toxicity to tissues had been exaggerated and that there was little evidence that it should be withheld on account of renal or hepatic insufficiency. On the other hand he believed that the doses often used were unnecessarily large. He gave 4 grammes on the first day of treatment and 3 g. on succeeding days for a week; the aim was to sway the fight in the favour of the host rather than to kill every organism. The action of the drug was enhanced by the presence of leucocytes and it was useless as a local antiseptic. If after ten days of suitable treatment with sulphanilamide the temperature was still raised, pus was probably localised, and the time had then come to call in the surgeon.

Mr. P. H. MITCHINER thought that if the surgeon were only called in after ten days the diagnosis might be reached after death. The first essential in treatment was complete local and general rest. Where pain prevented rest a judicious incision was justified for its relief. The liberation of fluids and efficient splinting might be necessary and he thought adequate openings rather than mere nicks were required. The second line in treatment was keeping up the fluid intake by drinks and subcutaneous saline. He had not been favourably impressed by the effects of blood transfusion and thought that the use of donors' blood was not justified where saline was at least as effective. Intravenous saline had to be given slowly to these cases for fear of producing œdema of the lungs. The judicious use of alcohol especially as spirits was distinctly beneficial. His practice had been to give Prontosil album to all bad septic cases starting with two tablets of 3 g. by mouth on the first day. The drug might be given up on the third day if the pulse-rate had not dropped, for the infection could then be assumed not to be due to hæmolytic streptococci; by that time the pathologist's report might be through. If there were a response to the drug one tablet was given daily until the pulse-rate and temperature were normal, usually in eight days. Prontosil was given even when staphylococcal infection

was suspected, to obtain the benefit of any doubt. His experience was that the drug was of little use in erysipelas either in checking spread or preventing relapses, but he was informed by the house surgeon of the septic wards at St. Thomas's Hospital that since prontosil had been adopted relapses had ceased altogether. Previously relapses had occurred in 40 per cent. of the cases. The spread of the rash seemed to be checked and the temperature came down in 8–10 days. These, he thought, must be recognised as beneficial results. Localised cellulitis did not improve without surgery.

Mr. T. B. LAYTON said that complete reliance on sulphonamides in all types of streptococcal infection would be a very serious matter. He thought the drug should be described as one which would help a small number of patients who could not be helped before. Surgical treatment by opening and removal of fluids still remained good. The middle-ear cleft seemed to be a special test-tube for the culture of streptococci, which were found there sometimes even after staphylococcal infection of the pharynx. Prontosil should be given when cases were too advanced for surgical treatment, but he doubted whether it was effective or specific. It might possibly mask symptoms without touching localised disease, removing streptococci from the blood, and leaving the infection in the middle ear.

Dr. MEAVE KENNY thought the first aim in treating puerperal infection was the saving of the patient's life. Quite often patients went out from hospital discharging freely but otherwise in good health. With only surgical means 99–100 per cent. of cases of puerperal peritonitis died. In pelvic cellulitis prontosil was apparently not so successful, but it checked both occurrence and spread, and it had also reduced the average stay in hospital.

Prof. J. B. CLELAND (Adelaide) asked whether prontosil should be started immediately after a finger had been pricked at a post-mortem or be delayed until infection had been contracted. He had seen a case of a girl with a streptococcal infection near the mouth in which the organism was recovered from the blood, and in which prontosil was administered. Agranulocytosis was discovered, the blood culture was then found to be sterile, and the patient died with a sloughing pharyngitis. At post-mortem a staphylococcal pneumonia was found; in the spleen chains of streptococci were found in an infarct, but none in the living tissue. It looked as though the streptococci had survived in the dead tissue and invaded the body when the drug was no longer being given.

Dr. CUTHBERT DUKES said that it was often possible to get a report on a blood culture in 24 hours. Three cubic centimetres of blood were sufficient for culture and sometimes the organisms were so numerous that they could be seen in a direct film.

Prof. J. PATERSON ROSS thought renal infection was often a serious complication of streptococcal infection. An incision was not always necessary for the relief of pain as elevation and the application of hypertonic saline were effective.

Mr. E. C. B. BUTLER said that at the London Hospital the dose given to adults was two tablets of 15 grains every eight hours; after four days the dosage was lessened. Intramuscular injection of sulphanilamide was painful and afterwards toxic effects were commoner and absorption was no quicker. A white cell count was done as a routine. Cyanosis had been in evidence in every case. Beneficial results had been obtained except where the infection was localised. The sulphonamide drugs were not a panacea and those who used them should be aware that toxic effects occurred.

Mr. J. P. HOSFORD asked what Mr. Mitchiner did when he pricked his finger at an operation.—Mr. CHARLES DONALD suggested the dictum that where there wasn't pus it shouldn't be let out. The fluid poured out in acute infections might be beneficial. About 95 per cent. of cases of lymphangitis subsided in 48 hours spontaneously.—Dr. G. A. H. BUTTLE said that the sulphonamide drugs were generally ineffectual clinically against staphylococcal infections, although they acted in mice.

The PRESIDENT considered that pain at an early stage of infection was a fair indication that an infection was streptococcal. He thought some infections—say after street accidents—could be prevented by the use of antiseptics; too much reliance was put on aseptic methods nowadays. When he pricked his finger at an operation he finished the operation, squeezed his finger and sucked it until he was tired of doing so; then he forgot about it. Inability to take food was a bad prognostic sign in infective cases. He welcomed the inclusion of rest in treatment; so many cases in war-time had been allowed to get up early and had died suddenly later.

Dr. DYKE, in reply, said that at present the evidence suggested that sulphanilamide should be taken before infection was established in a prick. He had seen hardly any cyanosis since all purgatives except paraffin had been forbidden.

Mr. MITCHINER said that when he pricked his finger during an operation he finished that first, usually winding a catheter round the finger for the time being to produce congestion. Then he sucked the finger and forgot about it; he was sure that was important.

SECTION OF PSYCHIATRY

AT a meeting of this section held on Feb. 8th the chair was taken by Dr. J. S. GOODALL, the president, and Dr. G. W. B. JAMES read a paper by himself, Dr. RUDOLF FREUDENBERG, and Dr. A. TANDY CANNON on a year's experience of

Insulin Therapy in Schizophrenia

The method, he said, had been in use at Moorcroft House, Hillingdon, since Jan. 1st, 1937, and 24 cases had been completed. The technique described last May[1] had not required any essential modification. He showed a film illustrating it, and advocated disuse of the word "shock" which exaggerated the dangers. A mortality-rate of 0·5 per cent. had been reported from Swiss hospitals, and probably this could be still further reduced by improvement and standardisation of technique. Emergencies arose with dramatic suddenness, however, and there must be no relaxation in vigilance or lack of essential appliances, if fatalities were to be avoided. Two serious emergencies had occurred in the year under review. The first was in a paranoid schizophrenic male of thin asthenic type with a history of cardiac collapses; he had had an epileptiform attack during his twenty-ninth coma, followed by pulselessness and venous collapse. Intracardiac glucose and subcutaneous adrenaline had restored him at once, but treatment had been discontinued. The second was in a paranoid schizophrenic aged 24, in excellent physical condition. During his thirtieth coma he had remained asleep and had become flushed and restless with extensor plantar responses. For three subsequent

[1] *Lancet*, 1937, **1**, 1101.

days he had suffered from headache, vomiting, and somnolence, but had ultimately recovered both physically and mentally. Prolonged deep coma might be necessary in certain cases, but introduced an added risk. Among 1628 patient-insulin days there had been 18 cases of late hypoglycæmia, all due to insufficient meals or vomiting. There had been no urticaria at all.

It was not easy to be precise about dosage; the aim was to achieve coma in the third hour of hypoglycæmia. Coma had been produced in one patient by 15 units and in another had required over 400 units. Sensitivity to insulin seemed to vary in the same patient during treatment. Blood-sugar estimations showed a fairly constant series of changes: a fall to 30 mg. per 100 c.cm., and a rise to a little below normal half an hour after interruption. In selected cases Cardiazol was given as well as insulin, because there seemed to be added benefit from the epileptiform attacks which it induced. The daily coma period must be extended gradually and should never be longer than an hour and a half. The hypoglycæmia was usually interrupted by giving weak sweet tea through a nasal tube. Epileptiform attacks were no longer regarded as an emergency, and the passage of the tube was delayed until their conclusion. Intravenous interruption had been necessary 106 times, owing to spasm, vomiting, cardiovascular reasons, twitchings, and failure to arouse half an hour after a tube feed.

Results should be classified strictly. Four groups were suggested. "Complete remission" represented disappearance of schizophrenic symptoms, normal affective relationship, full insight, and ability to return to normal work. "Incomplete remission" included return to work with persistence of one psychic symptom. "Partial remission" meant return to work with more than one symptom. The fourth class were "unimproved" and required hospital care. In the year now reviewed 10 cases with less than eighteen months' history had been treated, and 9 of these had resumed their former occupations. Of 14 long-standing cases treated, 2 had returned home and a third awaited discharge. All 3 of these had previously shown a tendency to remission. Some other old cases showed clinical improvement. The longest period of treatment was 118 days, the shortest 26 days, and the average 68. The average total in-patient period was 78 days. At least 60 insulin days should be tried before abandoning treatment as unsuccessful. The amount of insulin used was about the same in the recent and long-standing groups respectively; the number of insulin fits per 100 insulin days was 1·67 in the recent group and 6·54 in the old-standing group.

A further 94 cases collected by the British Psychiatric Insulin Society brought the total of cases to 118. Of these, 22 were of less than six months' history and 19 showed complete remissions; of 18 cases with from six to twelve months' history, 15 had recovered; of 9 cases between twelve and eighteen months, 5 had recovered; and 22 of 69 cases of longer standing than eighteen months. The joint percentage of complete and social remissions worked out at 51·7, which agreed with the Swiss figure of 52·5 per cent. given by M. Muller. These figures were well ahead of those for spontaneous remission; it remained to be seen how durable they would prove.

Dr. MURDO MACKENZIE thought there was a parallel between pyrotherapy and insulin treatment, but the comparison broke down early because general paralysis was a killing disease and its laboratory diagnosis was a matter of precision. The schizophrenic group were not like this, and experience alone could justify a new and drastic treatment. Great caution was necessary in applying it to recoverable adolescent emotional disturbances. Doctors and parents wanted to know whether insulin therapy was primarily for the acute and recoverable or whether old, chronic cases were also suitable.

Dr. H. PULLAR STRECKER thought insulin therapy should take its place as the most hopeful treatment of schizophrenia available. The early percentages of complete remissions in early cases were very encouraging. About 3000 cases had since been treated in different countries, and the figures of recovery had gone down. This was all to the good; a sound treatment like insulin therapy was not out to create records. Even if the figures were not higher than those for spontaneous remission, it would not matter, for insulin remissions could be obtained when required and their quality was better than those of natural recovery.

Dr. E. H. LARKIN agreed that insulin remissions were better than spontaneous ones. Treatment should be given to every case, just as appendicectomy was performed for appendicitis. It was not worth delaying, because spontaneous remission might never occur and long-standing cases, even when returned home, were little affected.

Dr. MILDRED CREAK asked the age of the youngest patient and whether insulin should be used for the severe brief psychotic attack of adolescence.

Dr. DONALD BLAIR thought that the relative merits of cardiazol and insulin should be carefully considered, since the former was a relatively simple treatment while the latter really demanded a specialist insulin officer.

Dr. HENRY YELLOWLEES said that duration of illness was open to immense variation of individual opinion.

The PRESIDENT said it had been shown that there was a lowered rate of oxygenation in schizophrenia,[2] that stupor catatonia could be benefited by hyperoxygenation, that toxins and amines reduced brain cell oxidation, and that the effect of cardiazol on the brain cell oxygen should be ascertained.

Dr. JAMES, in reply, said they had no experience of cardiazol alone; it was a rather terrifying experience if the patient were not first made sleepy with insulin. A combined use would perhaps prove a better method than either alone. The problem of duration of symptoms had been tackled by seeing two relatives and trying to arrive at the date at which some member of the family had first noticed the patient was queer. The youngest patient had been a girl of 19 with eight months' history; she had been well nearly a year. The treatment was empirical, as Dr. Mackenzie had said. Agreement was needed on the diagnosis of schizophrenia and the selection of cases for treatment. Insulin therapy was well worth trying up to two years and gave results nothing else could give. After five years they became less and less satisfactory, unless there had been a natural remission.

[2] See *Lancet*, Jan. 22nd, 1938, p. 210.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS.—Mr. N. St. John Dudley Buxton, F.R.C.S., will give a lecture to this institute on Friday, Feb. 18th, at 8.15 P.M., at the Welbeck Hotel, Welbeck-street, London, on modern treatment of fractures. Tickets may be had by members of the medical profession, from the secretary of the institute, 6, Holborn Viaduct, London, E.C.1.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION

ON Jan. 27th Dr. MEAVE KENNY addressed this association on the use of

Sulphanilamide in Obstetrics

She said that infection by the hæmolytic streptococcus is estimated to cause 1500 deaths among puerperal women each year in England and Wales, and in addition some 6000 or 7000 suffer serious illness from this cause. Though it is hoped that the majority of the deaths can be prevented with sulphanilamide these infections remain a disgrace to obstetrics. They are avoidable by an improvement in obstetrical technique, which nowadays must be understood to include the thorough grasp and conscientious application of rules for the antiseptic and aseptic conduct of labour and the puerperium. The measures advocated by Dr. Leonard Colebrook in his many publications on the prevention of puerperal sepsis are scientifically sound, simple, and practicable in all circumstances.

Many disabilities follow non-fatal sepsis and Dr. Kenny had found that sterility is a common remote effect (*Lancet*, 1937, **1**, 14). This in itself, she said, shows how much better it is to prevent the disease than to cure it. Relaxation of any part of the ritual for the prevention of infection, and reliance on the curative properties of sulphanilamide, may spell disaster. Laboratory and clinical trials of this drug at Queen Charlotte's Maternity Hospital Isolation Block have fully justified all claims made for it as a remedy for hæmolytic streptococcal infections, but though there is experimental evidence that it has some value as a prophylactic, its effects have been insufficiently studied clinically. Its use in this field is justified where a woman has been exposed to a known or suspected risk of hæmolytic streptococcal infection, or after operative delivery while awaiting the bacteriologist's report on a vaginal swab. Bacteriological investigation for every case of puerperal pyrexia cannot be too strongly advocated, both to enable the obstetrician to initiate or justify sulphanilamide therapy, and to avoid the conveying of infection to other parturient women, by early recognition of the necessity of isolation. The "compleat" obstetrician should not require legal stimulus to carry out this essential preliminary to the proper treatment of puerperal sepsis.

In other bacterial infections encountered in obstetrical practice sulphanilamide may also be useful—notably in the urinary infections of pregnancy associated with *Bacterium coli*. Here sulphanilamide appears to offer a reliable, simple, and rapid remedy, well tolerated even by the febrile pregnant woman who is intolerant of other therapy. In the majority of cases the symptoms disappeared and the urine became sterile in a far shorter time than with other urinary antiseptics. With the small doses given by the speaker and her colleagues at the British Postgraduate Medical School toxic effects were negligible (*Lancet*, 1937, **2**, 119).

The only remaining use of this drug as it affects the obstetrician is in the treatment of gonorrhœa. Dr. Kenny said that her experience here was too slight for her to offer any opinion except to plead for very careful laboratory and clinical trial before raising public hopes of a swiftly acting remedy. Neglect of this precaution may well lead to an increased spread of the disease by patients who are clinically relieved but bacterially active.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS

THE quarterly meeting of this association was held on Jan. 28th, Dr. L. P. LOCKHART presiding. In a paper on

The Health of the Coal-miner

Dr. S. W. FISHER (H.M. Medical Inspector of Mines) discussed in general terms the problems of the modern coal-mine in relation to health, from the viewpoint both of environment and specific hazards. The average number of persons employed in the coal-mining industry during 1936 was 767,100, about 2400 less than in 1935 and nearly 190,000 less than in 1929. Of these workers the great majority were subjected in some form or other to factors that tended to produce incapacity for work. Among the specific diseases to which the miner might be liable Dr. Fisher mentioned in some detail silicosis, nystagmus, beat hand, elbow, and knee, and infective jaundice. He outlined present-day theories of causation and pathology of silicosis and showed how important it was as a cause of serious disability for work in miners, particularly in South Wales. He showed how modern methods of lighting in mines were definitely preventing miners' nystagmus, and demonstrated the different types of lamp in use by miners in the past and to-day. Illumination in mines was intimately associated with safety and he welcomed the fact that during the past few years the number of electric cap lamps used by miners had greatly increased at the expense of hand lamps. After discussing in considerable detail the causation and prevention of accidents in mines and demonstrating various types of rescue apparatus, Dr. Fisher turned to the question of carbon monoxide poisoning. He mentioned in particular the delayed action that had caused so many fatalities in mine disasters. It was vitally important to use an oxygen and carbon dioxide apparatus to expel the residual gas from the body. It was valuable not only in gassing cases but also in the treatment of shock after any serious injury.

Dr. A. J. AMOR (Mond Nickel Company, Limited), giving a practical demonstration of the value of radiology in the diagnosis and prognosis of silicosis, said the problem was one of tremendous social significance. Incapacity for work as a result of injury or disease had caused some of the most tragic conditions in the miner's home. The eventual disablement produced repercussions on the whole economic structure of the community.

Dr. C. L. SUTHERLAND (Silicosis Board), Dr. A. MEIKLEJOHN (Silicosis Board), and Dr. E. R. A. MEREWETHER (H.M. Medical Inspector of Factories) also showed X rays of the thorax with reference to the difficulties of differential diagnosis and the estimating of degrees of disablement. They produced evidence to show that silicates may set up changes in the lung suggestive of some form of pneumoconiosis. It was likely that these changes were not producing an incapacitating disease.

Captain HAY (Mines Department) was present by invitation and demonstrated modern mechanical methods of dust prevention in mines, particularly at the cutting face.

REVIEWS AND NOTICES OF BOOKS

Biological Standardisation of the Vitamins

By KATHARINE H. COWARD, D.Sc., Reader in Biochemistry, University of London; Head of Nutrition Department, Pharmaceutical Society of Great Britain. London: Baillière, Tindall, and Cox. 1938. Pp. 228. 12*s.* 6*d.*

Dr. Coward has given us a unique and indispensable book. Others have written on the biological estimation of the vitamins, but no one else has attempted to expound the underlying principles of biological standardisation. There are common features underlying all methods of biological standardisation, but some of these are exaggerated in the case of the vitamins. Biological estimation of values has to depend on measurement of the magnitude of animal response, and the individual response to the same size of stimulus varies enormously in stocks of animals in different places or in the same stock in the same place at different times or even at the same time. To overcome this great inherent difficulty the international standard substances and their units have been set up. Their proper use and application demand the strict observance of certain very important precautions. With these Dr. Coward deals in what may be called the mandatory parts of her book.

She also describes the various methods of testing for each vitamin which she has found satisfactory in her laboratory; but, as she continually points out, other workers may have devised different but equally good methods of their own. These are the permissive parts of the book. Only four vitamins are dealt with—A, B_1, C, and D—since these are the only four for which international units and standards have so far been set up, and for which, therefore, reasonably quantitative biological estimation can be expected. One chapter, devoted to "the interdependence of the vitamins," shows how insufficiency of one vitamin may limit the response to administration of another, particularly when the response is by growth. We should have preferred to define this concept "vitamins as limiting factors," but the criticism is a small one and the critic falls silent as the general feeling of profound thankfulness for the book prevails.

The second part of the book is devoted to the statistical estimation of the accuracy to be expected from results of experiments when carried out as laid down in the first part. Dr. Coward says in the preface that this part of the book is written "in the hope that even students who are not mathematically inclined will nevertheless read it and decide that the statistical treatment of results is very simple after all." While adding to the value of the book, this part is held sufficiently in the background for the statistically timid not to be deterred from using the first part.

As an appendix is reprinted the report of the second international conference on vitamin standardisation held in 1934. Nothing in fact is omitted which could enhance the usefulness of this work. If only it could be translated into the languages of all those who make biological estimations for vitamins, and be read and applied by them, the world might be supplied with the reliable series of uniform values for the vitamin content of foodstuffs so sorely needed for compiling the vitamin values of diets as scheduled by modern dietary surveys. As it is, chaos prevails.

The 1937 Year Book of Eye, Ear, Nose, and Throat

By E. V. L. BROWN, LOUIS BOTHMAN, GEORGE E. SHAMBAUGH, ELMER W. HAGENS, and GEORGE E. SHAMBAUGH, Jun. Chicago: Year Book Publishers; London: H. K. Lewis and Co. 1937. Pp. 640. 10*s.* 6*d.*

WE welcome the 1937 number of this excellent publication from the hands of the same five teachers in the University of Chicago who have been responsible for it during a number of years. It consists, as before, of a vast number of abstracts from the current literature of the specialties mentioned, carefully selected and well arranged. The editorial comments are often helpful and are informed by a wholesome conservatism. No striking advance in any particular direction is recorded this year, but there is evidence of an immense amount of research in all corners of these fields. Many interesting cases are reported, among them one of chronic granuloma of the orbits in a negro, with extreme bilateral exophthalmos, M. Zethelius reports 45 cases of acute retrobulbar neuritis, in 36 of which the vision became normal or nearly so under treatment by lumbar puncture. There are two reports, one favourable and one not, on the treatment of optic atrophy by injections of atropine. Allergic manifestations in the nose attract much attention, and there are several useful attempts to evaluate the results of surgery and irradiation in cancer of the larynx. The book, like the previous numbers, will be very useful to those who wish to keep in touch with recent work in these subjects.

Management of Fractures, Dislocations, and Sprains

Second edition. By JOHN ALBERT KEY, B.S., M.D., Clinical Professor of Orthopedic Surgery, Washington University School of Medicine; and H. EARLE CONWELL, M.D., F.A.C.S., Consulting Orthopedic Surgeon to the Tennessee Coal, Iron, and Railroad Company. London: Henry Kimpton. 1937. Pp. 1246. 52*s.* 6*d.*

THE second edition of Key and Conwell's work is a sound and balanced exposition of treatment of injuries to bone and joint, based on what must be a wide experience of different methods. There are many photographs of the actual deformities encountered—a feature apt to be neglected in books on this subject or represented only by drawings that have done service for many years. The authors emphasise the value of physical signs in diagnosis and regret the tendency to rush for X rays without making a proper clinical examination. They do however admit the necessity and importance of radiography and include many X ray reproductions. These latter and an adequate number of diagrams are placed in satisfactory relationship to the text.

The mechanical principles which underlie the reduction of fractures and dislocations are fully and carefully explained, but more emphasis might have been laid on the value of traction and the amount of force to be employed. In general the form of splinting that is recommended is based on padded or slab plasters for cases in which displacement is not likely to recur after reduction—as in the fore-arm and wrist and leg and ankle. Where skeletal traction is

required the Kirschner wire, ice-tong calliper, or fine pin is used. The authors' preference in treating intracapsular fractures of the femoral neck is for the Whitman abduction plaster. The use of the Smith-Petersen pin is fully described, but the question in which type of case it could or should be employed is avoided. When this book first appeared we commented on the possible lack of understanding of the principles laid down by Sir Robert Jones in advocating treatment of supracondylar fractures by flexion of the elbow-joint. The section is still a little indefinite. In discussing restoration of extension after such flexion treatment some distinction should be made between adults and children; in children the carrying of heavy weights as depicted may delay such restoration. In general the care the authors take to give a broad outlook and choice of methods in treatment may lead to confusion in the minds of the less experienced reader. For example in the case of the fractured clavicle eight methods are described and these do not include the classical Sayre's and Newmarket methods. The indications for selection of the appropriate measure in different types of case are put forward but hardly enough emphasis is laid on the fact that the ultimate functional result is equally good in any of them.

It is gratifying to find a good description of acromio-clavicular dislocations in which the acromion is usually displaced downwards by the weight of the shoulder girdle as a result of tearing of the coraco-clavicular ligaments in addition to those of the joint capsule. In many books the impression given is that the clavicle is displaced upwards and treatment may be based on a wrong assumption. The chapters on the skull, and on the jaws and face have been specially contributed and make good reading. Sections on workmen's compensation and on the medico-legal aspect of fractures contain many warnings of the dangers that beset the unskilled or unwary but naturally are written from the American point of view.

There is not much necessity for references; those that are given are almost exclusively American. Misprints and spelling errors are very rare. The production is admirable but the book is a little heavy—it weighs six and a quarter pounds.

The Catholic Doctor

By Fr. A. BONNAR, O.F.M., D.D. London: Burns, Oates, and Washbourne. 1937. Pp. 181. 7*s.* 6*d.*

THERE has long been a need for a simple exposition of Catholic medical ethics, written from the British professional standpoint and intelligible to the ordinary reader. In endeavouring to supply this want Father Bonnar's task has not been an easy one. He has had to master the technicalities of two vast and widely different specialties, theology and medicine, and to adjust their rival claims. An acknowledged expert in moral theology he has shown considerable tact in avoiding all pretension to personal knowledge of medical problems, but he has been at pains to collect representative medical opinions. Within a surprisingly brief compass he manages to give a general outline of the foundations of Catholic belief and of the ethical basis of the rules that bind the Catholic in dealing with problems such as contraception, the administration of baptism, and the belief in miracles. His explanations are lucid and non-technical and show a sympathetic appreciation of the non-Catholic point of view. In the chapter on "Aiding and Abetting" for example, he makes it clear that the non-Catholic patient must be given an opportunity for obtaining the treatment she wishes, even if it is opposed to Catholic teaching.

On general matters, Father Bonnar's teaching follows closely the highest traditional standards of professional conduct. The doctor, he holds, is under an obligation in religion to keep his medical knowledge up to date, to observe the code of professional ethics current in his country, and to preserve his patients' secrets inviolate. He is guilty of "injustice" in the theological sense if by reason of his incompetence he puts his patient to the expense of unnecessary consultations or if he sends his panel patients into hospital without sufficient reason. Where cleavage with non-Catholic medical practice occurs, as over the use of contraceptives and therapeutic abortion, Father Bonnar makes it clear that his position is based on a closely knit philosophy and not on mere obscurantism. Still less is it actuated by lack of humanity or respect for human life. The desirability of avoiding pregnancy in women with any form of active or recently arrested tuberculosis, or with renal disease, might however have been more clearly expressed, for it is a matter on which doctors sometimes have considerable difficulty in persuading patients. On the disputed question of the treatment of an unruptured ectopic gestation, Father Bonnar definitely supports the view, which is both humane and scientifically correct, that there can be no objection to excision at any stage since the tube itself is morbid.

The chapter on psychotherapy marks an advance in the understanding between priest and doctor. The writer wisely repudiates some of the popular generalisations about the confessional doing away with the need for psychotherapy and "every doctor being necessarily a practical psychologist." Such criticisms, he points out, "fall wide of the mark . . . there are cases which call for real psychological treatment . . . it cannot be too strongly emphasised that the priest's ministrations and especially the administration of the sacraments have no medical purpose." Yet the priest may be able to do more than anyone else in restoring that tranquility of mind which is an essential condition for sound health and in taking away the sense of guilt which is such an important factor in many neuroses. Unfortunately the chapter on "sexual aberrations" does not maintain the same level of perception. Few doctors would subscribe to his dictum on homosexuality: "in a person who has not acquired the habit of self-control, the sexual appetite, if unable to attain its normal object, will seek satisfaction in other ways. Perhaps all sexual abnormalities can be explained in this way." It is also surprising to find views on sex education so timid and reactionary. He distrusts biological teaching as likely to "arouse morbid curiosity" and recommends that until the age of 14 or 15 "children's questions should be put off with a very general answer such as that it is God who sends us all into the world, that His way of doing so is very wonderful and will be explained in due time." Long before the "appointed day" any child with a spark of spirit would have got the information it wanted elsewhere, and would incidentally have acquired either resentment or contempt for the way its very natural desire for knowledge had been met.

Apart from these flaws Father Bonnar has written a valuable book, which deserves a wide circulation among his co-religionists.

THE LANCET

LONDON: SATURDAY, FEBRUARY 12, 1938

THE MODERN FEVER HOSPITAL

THERE was a time when people with typhoid or scarlet fever had to be removed from their homes by stealth or wile. Now the public is coming to demand the hospitalisation of infectious cases, and the list of diseases admitted to the large fever hospitals grows steadily longer. This has brought with it increasingly the danger of a patient admitted for one disease being infected with another, and the avoidance of cross-infection has taxed the administration of fever hospitals and has led to the trial of new methods of construction. The difficulties are formidable. In the first place by no means all the patients notified as suffering from this or that disease are actually found to be so suffering when the ambulance reaches the hospital. On p. 97 of the recent report [1] on L.C.C. hospitals for 1936 is a table showing errors in the notified diagnosis of cases admitted to acute hospitals; revision was required in 24 per cent. of the total notifications of diphtheria, in 34 per cent. of the enteric group, 7 per cent. of measles, 10 per cent. of scarlet fever and whooping-cough. In fact out of some 35,000 arrivals more than 4000 could not for this reason alone be admitted to open wards reserved for specific infections. When to this has been added the large number of patients who on admission were found to be suffering from more than one infection, or known to have been exposed to a second infection, it is obvious that the fever hospital must dispose of a large number of beds for the segregation of such cases.

But patients in fever hospital wards do not only run risk from the introduction and spread of extraneous specific infections. Though these may clog the administrative machinery they are of secondary importance, for they endanger life but little, whereas an outbreak of broncho-pneumonia in a measles ward may be deadly; commonly regarded as one of the inevitable perils of hospitalisation it may really be a cross-infection by hæmolytic streptococci, although of type other than that causing scarlet fever. Until lately no steps were taken to remove from the general ward such reservoirs of infection as cases of broncho-pneumonia, otitis media, impetigo, and enteritis in the course of measles. If these patients remain in the open ward without precaution of any sort there exists a perpetual state of cross-infection. Even in a scarlet fever ward where the primary infection is the hæmolytic streptococcus the retention of patients with such complications leads to the occurrence of late complications of septic type, whether due to reinfection with the same strain or with another strain of streptococcus. Adequate spacing of beds does much to minimise the danger. To overcrowd a ward is to invite a high rate of septic complications and, to put it at its lowest, is false economy. An overcrowded ward means an overworked staff, and hard pressed nurses will from time to time inevitably cut corners. Even in the well-spaced ward the device of barrier nursing should be regarded as a temporary measure unless the staff is specially experienced; otherwise a false sense of security may result. Bed-isolation, where every patient is nursed in barrier, may make it possible to segregate within a single ward any acute specific infection (other than early measles and chicken-pox), all types of extraneous non-specific conditions (such as broncho-pneumonia and otitis), and patients under observation pending diagnosis, but it is extremely exacting for the staff and the added stress may readily lead to physical breakdown among the nurses. Bed-isolation therefore cannot be regarded as a normal state of things unless the hospital can rely upon a succession of nurses well trained in general surgical work and especially in the methods of asepsis. Such a staff is not easy to recruit and retain in these days; it was much easier twenty years ago.

So far we have considered segregation based upon the invisible barrier. It is now generally accepted that the big open undivided ward is obsolete. During the transition the movable screens devised by HUTINEL many years ago are coming into use again; they afford ready means of establishing conditions resembling a partial cubicle around any bed. A convincing expression of the modern tendency may be seen in the new blocks approaching completion at the North-Eastern Hospital (L.C.C.), Tottenham, where the main wards are subdivided by glass screens into five sections each of which accommodates four beds spaced in parallel. The idea of grouping by fixed screens in these new wards is not so much to prevent the transference of specific infections as the non-specific infections of the upper respiratory tract arising from droplet spray. The ideal method of segregation is seen in the wardlet containing one or two beds with complete structural separation from the next in the series. Provided the aseptic technique, for which every facility exists, is rigidly carried out, diseases of any description may be nursed in them without spread. Such wardlets are available at the North-Eastern Hospital both in the form of annexes to the main ward blocks and as two large chamber blocks providing 112 single-bedded wardlets. When reconstruction is complete nearly 40 per cent. of the total accommodation at this hospital will be in the form of these one- or two-bedded cells. It has often been objected that children nursed in

[1] Annual Report of the London County Council, Vol. IV. (Part 1). London: P. S. King and Son. No. 3308. 2*s*. 6*d*.

single chambers become bored and depressed. Whether this occurs or not depends largely upon the lay-out; surrounded by brick walls of the old side-ward type the children soon became dejected. It is not the experience in the new chamber blocks where glass walls afford a wide prospect for the patient as well as adequate supervision for the nurse. With these new types of ward life has become immeasurably more desirable both for the patients and those who attend on them, and it is lamentable that just when the conditions of fever nursing have become so attractive there should be a grave difficulty in recruiting enough nurses to make full use of the hospitals. This has now led to the restriction in the admission of scarlet fever, measles, whooping-cough, and dysentery to cases in which the severity of the disease and the condition of the home make hospital treatment essential. One cannot help feeling that a visit to one of the new fever wards on a bright morning would turn the scale in the decision to train as a nurse and we hope that municipal authorities will take every care to put their fever hospitals on the map.

THE SWEAT GLANDS

THE chief function of perspiration is to assist in regulating the temperature of the body; the heat lost by the skin is increased many fold by evaporation, particularly at high temperatures and during muscular exercise. Secretion of sweat, however, is not the only mechanism by which water is given off from the skin. WHITEHOUSE, HANCOCK, and HALDANE [1] found that during rest under ordinary conditions of temperature practically the whole of the moisture given off from the skin passed through by osmosis or diffusion, the osmotic passage of water increasing rapidly as the skin temperature rose and playing a large part in heat regulation. Osmotic transference is, actually, the only available mechanism of water loss from the skin for individuals with congenital absence of the sweat glands, of which a few cases have been investigated. The glands are not in fact essential for life, though their absence may be a serious handicap, especially when associated with defective regulation of the skin circulation. On the other hand excessive sweating, if combined with free drinking of water, may produce water-intoxication, either in the common form of undue fatigue or the acute form of muscle cramps. Between the extremes of total suppression and excessive loss there are many features of sweat secretion which deserve closer study. Some years ago Dr. YAS KUNO, the Japanese physiologist, drew attention [2] to something which had previously been almost overlooked—namely, sweating in response to emotion, mental effort, or sensory stimulation, with a peculiar limitation to the palm, the sole, and the axilla. In our last issue KUNO recounted further investigations of sweat secretion by himself and his associates; the results are no less surprising, though perhaps less readily susceptible of explanation, than the facts of mental sweating. It seems that a considerable number of sweat glands, although morphologically fully developed, do not secrete even under conditions which call for maximal activity. Accordingly KUNO divides the sweat glands into active and inactive. The inactive glands cannot be thrown into activity by intense body warming, even when this stimulus is repeated frequently, or by local injection of pilocarpine which acts directly on the gland cells without the intervention of nervous mechanisms. Some observations suggest that a limited activation of such inactive glands may occur during early childhood, but in the adult there are many glands which are never in action under physiological conditions, and which are therefore useless as a reserve force to be called upon when the need is urgent. It is possible that activation of inactive glands may occur under stimulation by other pharmacological agents or during the abnormal sweating responses which arise in certain pathological states of the central nervous system, and we hope that Dr. KUNO will continue this study. More data on the ratio of inactive to active glands in different situations would be valuable, and investigation would be facilitated by improved methods of recording activity of the sweat glands.

THE PROGNOSIS OF SCHIZOPHRENIA

IN another part of this issue two papers will be found, one of which briefly describes the use of Cardiazol to evoke convulsions in the treatment of a dozen cases of schizophrenia, while the other reviews the respective merits of this form of therapy and of induced hypoglycæmia, which are already the subject of temperate dispute.[1] The use of convulsions and coma to overcome the resistances of mental disorder is exceedingly dramatic and these two papers, with the discussion reported on p. 378, well illustrate what is being attempted and done. It is evident that favourable results have been reported by many competent workers, yet it is still advisable, perhaps, to approach the subject with reserve. Prima facie, it is probable that a remedy so startling, for a disease so severe, will arouse hopes and generate claims that, however sincere, have little to do with the actual efficacy of the method under trial. (The history of tuberculosis gives us plenty of examples.) Study of the natural prognosis of the condition under treatment provides some safeguard, as Dr. PULLAR STRECKER and others have recognised, against exaggerating or underrating the value of a new remedy. Yet sometimes this essential is deliberately ignored. Thus in recording their observations on the treatment of schizophrenia CAMERON and HOSKINS [2] say: "No attempt was made to select on the basis of reaction-type or on probability of recovery. Our experience in the latter regard has been that the

[1] Whitehouse, A. G. R., Hancock, W., and Haldane, J. S., *Proc. roy. Soc.* B. 1932, **111**, 412.
[2] *Lancet*, 1930, **1**, 912.

[1] *J. Amer. med. Ass.* 1937, **109**, 1470.
[2] Cameron, D. E., and Hoskins, R. G., *J. Amer. med. Ass.* 1937, **109**, 1246.

correlation between prognosis recorded at the time of admission and subsequent progress is almost negligible." Most psychiatrists are certainly not of this opinion[3]: the factors entering into judgment are no doubt complicated, but an expert's forecast is much more often right than wrong.

A careful study made in Norway recently and reviewed in our columns[4] reaffirms that to assess prognosis in schizophrenia is by no means a deceptive exercise like casting a horoscope or reading the entrails of a sacrificial beast. LANGFELDT studied the subsequent fate of a hundred cases of undoubted schizophrenia admitted between 1926 and 1929 to the University Psychiatric Clinic in Oslo: he made personal investigations, being rightly convinced that it is inadmissible to speak of the recovery or partial recovery of any patient on the strength merely of statements made in letters from the patient or his family. As the result of his inquiry, he concludes that the boundaries of schizophrenia are now set so generously wide that several conditions, with very different prospects of recovery, may be covered by the term. The proportions in which the doomed and the atypical, more hopeful, varieties are mixed in any selection of material will determine how many "recoveries," "spontaneous remissions," "cures," are reported as characteristic of schizophrenia as a whole. LANGFELDT considers that the more optimistic results reported as obtained with insulin, say, or psychotherapy, rest on this diagnostic laxity: where there is a stricter interpretation of schizophrenia no such triumphs are recorded. It is too much to hope for the same degree of precision in the initial diagnosis of schizophrenia as is attained, for instance, with tuberculosis. There are no tangible proofs of the disease, great experience and judgment are necessary, and there is room for wide latitude of usage. It is well known that some clinics like to use independent standards and categories while clinging to the accepted names, and that diagnoses by poorly trained and inexpert psychiatrists are worthless to a much greater degree than in other branches of medicine. Hence the foolish statement is sometimes made that diagnoses in psychiatry are futile labels, not worth the affixing. Diagnosis is indeed of the first importance. Some of the most lamentable disappointments, and even tragedies, in the history of psychiatric treatment have been due to carelessness in diagnosis, and ignorance or contempt of the accepted canons. LANGFELDT'S strictures on the uselessness of bare reports of such-and-such a percentage of "cured schizophrenics" are therefore appropriate. Until this state of affairs has been remedied by the better training of psychiatrists or the discovery of some less complex and intangible criteria of diagnosis than the patient's talk and behaviour, it will be necessary for each country, and perhaps for each clinic, to work out the statistical prognosis for the cases which it has agreed to classify as "schizophrenia." In England relatively little work of this kind has as yet been published—a good thing, on the whole, since if there were a host of such studies they could scarcely be trustworthy, but would be more likely to darken counsel by their contradictions. A reliable prognostic study requires such full records and uniformity in diagnosis, so much skill, time, trained help, and personal visiting (in their homes or elsewhere) of all the patients concerned, years after they were first seen, that it cannot be carried out wholesale. LANGFELDT was fortunate enough to be able to trace all his patients. In England this is a more difficult task than in Norway, though we have here in the records of the Board of Control an invaluable centralised storehouse of material about each of the patients who may have had a relapse after discharge from hospital: failure to include individual details about such cases, which experience has shown are especially apt to evade notice in an inquiry, can make the research of very little value.

A careless investigation does nothing but harm. Careful ones go further than merely to provide comparative data for assessing the value of a new method of treatment: LANGFELDT, for example, believes that he can now distinguish in his series of cases the features which would have made it possible in the beginning confidently to tell the group of progressive cases from those in which the environmental factor was stronger than the hereditary, and outlook for more or less "spontaneous" recovery good. But wisdom after the event is justly suspect. Moreover, "spontaneous recovery" is so often used to mean recovery under favourable circumstances of care, without the use of any novel or supposedly specific method, that the efficacy of undramatic but rational measures is less regarded than it should be. All these factors must be weighed in any inquiry into the later history of schizophrenic patients. "Catamnestic" studies are difficult and, unless expertly made, deceptive: but without them the clinical psychiatrist is at the mercy of arbitrary notions, with none of those checks upon his wisdom which other doctors find, or submit to, in the autopsy room and the operating theatre.

[3] See *Lancet*, "Prognosis," Vol. I, p. 265; Faurby, A., *Nord. med. Tidskr.* 1937, **13**, 206.
[4] *Lancet*, 1937, **2**, 1434.

PRESENTATION TO SIR ARTHUR KEITH

ON Monday next at 5 P.M. Sir Arthur Keith, F.R.S., will deliver a lecture at the Royal College of Surgeons of England on the Prehistoric People of Palestine. He will summarise the results of the investigations which he and Mr. T. McCown have been conducting on the anatomical characters of the Mousterian peoples discovered near Mount Carmel in 1931 and 1932. Before the lecture a bronze bust of himself will be presented to him by the president of the Royal College of Surgeons on behalf of a large number of his friends and admirers in commemoration of his twenty-five fruitful years as conservator of the museum. Executed by Miss Kathleen Parbury, the bust is of real merit and recalls one of Sir Arthur's familiar attitudes. Admission to the lecture is by ticket to be had from the secretary, R.C.S., Lincoln's Inn-fields, W.C.2.

ANNOTATIONS

ANÆSTHESIA AND THE UPPER ABDOMEN

PERHAPS the most severe test of an anæsthetist's knowledge and art is to ask him to obtain and maintain perfect muscular relaxation during an upper abdominal operation, while ensuring a minimum of trouble afterwards. That there is no royal road to these ends was well brought out by the discussion following Dr. H. K. Ashworth's admirable paper read to the anæsthetics section of the Royal Society of Medicine on Friday of last week. After describing the various methods evolved during the last decade or so, he pleaded for a crystallisation of ideas about the best procedure. Subsequent speakers showed how it seems that equally good results are obtainable with endotracheal gas-and-oxygen, local analgesia combined with light inhalation anæsthesia, the old-fashioned open ether, and the latest cyclopropane. The truth no doubt is, as Prof. R. R. Macintosh suggested, that the man is more important than the method he employs, and very diverse methods bring the same good results when conducted by anæsthetists with the same high level of skill. Nevertheless a listener to the debate found himself able to draw certain morals. The first of these was that for any long abdominal operation some measure of local analgesia is likely to be of great value. The reason that it is not more generally used seems to be that it occupies extra time for the surgeon; but such a reason is not a good one, for with proper organisation the surgeon should be free to employ what he considers the best possible technique, and should not have to consider time except in so far as it affects the patient's welfare. If the extent of his hospital operating-list is such that he is indeed handicapped in this manner, then alteration is called for in the organisation which makes lists of this kind necessary. Another notable feature of the discussion was that there seemed to be no doubt about the deleterious effect of long deep ether anæsthesia, though when the operator is speedy the older methods, which rely mainly on ether, yield excellent results. Dr. Ashworth recommended a week or more of training for the patient who is to undergo a deliberately planned operation on the upper abdomen, and another speaker would add to it special breathing exercises, so that during recovery the patient should employ his accessory muscles of respiration when the diaphragm is hampered by the incision. Opinion as to the value and the risk of spinal analgesia for upper abdominal operations appeared to be as varied as ever. The lamentable results described by one speaker were balanced by the satisfaction expressed by others who had employed it for similar operations. Some of the most interesting—or at least most novel—views related to the decontrol of patients after inhaling the high oxygen percentages given with cyclopropane, and to the measures by which the need for any such decontrol may be avoided.

EXPERIMENTAL RENAL HYPERTENSION

Richard Bright in 1827 described enlargement of the heart in fatal cases of kidney disease. Since his time much confusion has arisen from our ignorance of the relationship between renal disorder and high blood pressure, and of late years the problem has often been tackled afresh. Many workers have studied the hypertension that follows incomplete occlusion of the renal arteries in animals, and it has been clearly shown that the rise in blood pressure is not brought about by a nervous reflex from the kidney. Moreover, renal insufficiency is not essential for its production, since the blood pressure rises after incomplete occlusion of one renal artery. The theory that a damaged kidney may release a pressor substance into the circulation takes us back to Tigerstedt and Bergman's [1] observations at the end of last century. They gave the name "renin" to a pressor principle which they demonstrated in saline extracts of the rabbit's kidney. Harrison and his co-workers,[2] at Nashville, Tennessee, who have produced hypertension in dogs by the method described above, state that on injection into rats saline extracts of the ischæmic kidneys have a greater pressor activity than have normal kidney extracts. There is no evidence however that this increased pressor activity is responsible for hypertension in the dog, and attempts to demonstrate circulating pressor substances have been unsuccessful. It has not been shown that the ischæmic kidneys contain an excess of the normal pressor substance (renin) or indeed whether the latter plays any part in the regulation of the blood pressure. These problems demand a more exact chemical analysis of extracts obtained. Nevertheless the above experiments suggest a physiological rôle for pressor substances derived from the kidney, and if this is substantiated we may hope for a clearer understanding of the relationship between hypertension and renal disease in man.

LETHAL GASES IN HYGIENE

IN these days when the word "gas" suggests masks for babies, decontamination squads, and other horrors, it is pleasant to survey the diversity of uses to which poisonous gases can be put in the service and not for the destruction of mankind. At a meeting of the epidemiological section of the Royal Society of Medicine on Jan. 24th Dr. P. G. Stock of the Ministry of Health made such a survey. The subject of lethal gases and their use in disinfection and disinfestation is one that he has made his own and he spoke from the experience of many years.

Lethal gases are used in disinfection; in the purification of water and sewage; in the destruction of vectors of disease, such as rodents, fleas, mosquitoes, and lice; and for the eradication of insects, such as the bed-bug and other pests, for economic reasons. In disinfection the burning of sulphur has been known from remote times, being mentioned by Homer and Hippocrates. As for rodents, the most important use of gas is in the deratisation of vessels, which received a great impetus from the International Sanitary Convention of 1926. The destruction of lice, fleas, and mosquitoes has also been effected by gas, while the disinsectisation of aeroplanes is becoming more and more important with increasing danger of the spread of yellow fever by air traffic. In a plane more even than anywhere else is it essential that, if a lethal gas is employed, no traces shall remain that might affect the occupants. In addition, problems of weight are important when apparatus has to be carried in aircraft, and although great advances have been made the ideal means of ridding aeroplanes of insects has not yet been found. Disinfestation in general is complicated by the varying resistance of different kinds of insects to the same

[1] Tigerstedt, R., and Bergman, P. G., *Skandv. Arch. Physiol.* 1898, **8**, 223.
[2] Harrison, T. R., Blalock, A., Mason, M. F., and Williams, J. R., *Arch. intern. Med.* December, 1937, p. 1058.

gas. The crew of a vessel will judge the efficacy of a fumigation by its effect on those crickets of the sailor's hearth, the cockroaches. In actual fact, however, as Dr. F. H. White, late chief medical officer to the Port of London Authority, remarked in the discussion on Dr. Stock's paper, cockroaches only become a public health problem when they invade the first-class passenger cabins.

It was natural that Dr. Stock should have much to say about hydrogen cyanide, in view of its widespread use and dangerous properties. He agreed with American experience that the admixture of lacrymatory gases is liable to lead to a false sense of security. In the eradication of bed-bugs, in houses and furniture particularly, various new gases have been tried such as orthodichlorbenzene, ethylene oxide, and heavy naphtha. All have their disadvantages and a really satisfactory gas has yet to be discovered. A good deal of research is now going on under the auspices of the Medical Research Council, but in practical fumigation we are still behind the United States, where ship fumigation, for example, is done by the U.S. public health service. In this country, as Dr. White pointed out, fumigation is in the hands of commercial enterprise and is carried on for profit. Anyone may set up as a contractor and send inexperienced men to scatter such highly dangerous substances as cyanide in such manner as seems best to them. This has occasionally led to neglect of elementary precautions and consequently to fatalities. Under the Hydrogen Cyanide (Fumigation) Act, 1937, however, regulations have now been drafted under which an operator engaged in such work must have had not less than two years' regular experience of fumigating buildings with hydrogen cyanide.

IDIOSYNCRASY TO TOBACCO

APART from the familiar distressing effects of first attempts at smoking, which pass off when tolerance is acquired, two types of abnormal reaction to tobacco may be distinguished: first, a tobacco allergy which may be demonstrated by skin tests, and secondly, a true idiosyncrasy, an exaggeration of the effects of tobacco on a normal person. Sulzberger [1] found that 16 per cent. of non-smokers, 36 per cent. of smokers, and 77 per cent. of patients with thrombo-angiitis obliterans gave positive skin reactions to patch-tests with tobacco. These people were unaffected by a nicotine solution and reacted to denicotinised tobacco, so that they were probably sensitive to tobacco proteins or the bacterial proteins produced in the process of curing rather than to nicotine. This was confirmed by their being affected differently by different brands of tobacco.

Experimentally the injection of nicotine produces a transitory rise of blood pressure with peripheral vasoconstriction, and as about half of the nicotine in tobacco comes out in its smoke, one would expect that smokers would show similar effects. Lampson[2] found that a group of healthy students after inhaling tobacco smoke showed an average rise of 12–15 mm. in systolic blood pressure, an acceleration of up to 20 beats per minute in pulse-rate, and a decrease of about half in the blood flow in their peripheral vessels. Haggard and Greenberg [3] have observed a rise of blood-sugar after smoking and suggest that this and the vascular changes result from an increased secretion of adrenaline due to the sympathetic stimulation of nicotine.

[1] Sulzberger, M. B., *J. Immunol.* 1933, **24**, 85, 265, and 425.
[2] Lampson, R. S., *J. Amer. med. Ass.* 1935, **104**, 1963.
[3] Haggard, H. W., and Greenberg, L. A., *Science*, 1934, **79**, 165.

In the normal person these effects are negligible, but exceptionally they may be so exaggerated as to cause definite symptoms. Herrell [4] has lately described the case of a man of 57 who had attacks of severe dizziness and mental confusion which came on after his morning cigarette. His blood pressure before smoking was 118/70 mm., but three minutes after a cigarette it rose to 180/110 mm. and he felt dizzy for an hour or so. This was associated with vascular spasm, for there was a fall in the surface temperature of his fingers of from 1 to 1½° C. Immersion of his hand in ice-cold water, which normally causes a slight rise in blood pressure, produced the same exaggerated rise. He showed no skin reaction to a patch-test with tobacco. He had no more attacks when he gave up smoking, and a troublesome urinary frequency which he had had, and may have been due to the effects of transitory rises of blood pressure on his renal activity, also disappeared. There was no question of allergy here, but an unusual susceptibility to nicotine. Patients with essential hypertension respond to the cold test as this man did, and it is possible that many of them react similarly to tobacco.

FRACTURES OF THE HANDS AND FEET

THE aims of treatment are somewhat diverse in fractures of the hands and of the feet, as was apparent in the discussion last week in the section of orthopædics of the Royal Society of Medicine. In the foot the objective is painless weight-bearing; in the hand it is to restore full function without stiffness. There is disability in fractures of tarsal and metatarsal bones when bony deformity leads to uneven stress and strain on the all-important ligaments supporting the arches of the foot. From this it follows that anatomical reduction of fractures is a vital consideration, and that fixation should be prolonged during the whole period of consolidation. The hand is a more primitive structure. The elaboration of its function depends on its intricate muscular development, extensively represented in the motor cortex, and on the freedom of movement possible as its many joint surfaces. In any injury of the hand attention must first be focused on retaining free muscular movement. According to Mr. Norman Roberts, one of the openers of the discussion, it is a mistake to strive after perfect anatomy where it can be obtained only at the expense of stiff fingers. He cited over-splinting and splinting of the knuckles in the extended position as the two commonest mistakes in treatment. Knuckles kept for a prolonged period in extension always become stiff, and this is particularly true with fractures involving the heads of the metacarpals. He is opposed to the method of treating these by bandaging the fingers round a bandage or ball held in the palm of the hand, because this immobilises the fingers completely. He prefers a dorsal plaster cast moulded round the hand and allowing use of the fingers from the start. He employs extension to reduce angulation deformity where it is severe, but not specifically to reduce shortening, for this is rarely disabling. Bennett's fracture-dislocation of the bone of the first metacarpal is the one fracture requiring a combination of continuous traction with plastic splinting. The straight splint for the fingers was roundly condemned by more than one speaker. Broken phalanges should be treated in flexion, either by wire splints or by dorsal strapping carried down to the front of the wrist. The minimum of splinting

[4] Herrell, W. E., *Proc. Mayo Clin.* 1938, **13**, 1.

and the earliest possible restoration of function was advocated.

In the foot to reconstruct the skeleton is the surest means of restoring function. Eastwood,[1] it is true, has recently reported a series of fractures of the os calcis in which good function was restored without attempting to reduce the deformity. But most surgeons insist that strong and painless feet are obtained only when the alignment of joint surfaces is as nearly as possible anatomical. Mr. Gordon Irwin said that his investigation of the results obtained by modern method has convinced him that all the efforts at efficiency had justified themselves. The insurance companies' statistics showed that the period of disability in fractures of the metatarsals had been cut down to a half or two-thirds of that of ten years ago. All his patients with these fractures now returned to full work, and this most often meant heavy industrial labour. The two principles of modern treatment were accurate anatomical reduction of deformities and fixation in a plaster splint that allowed walking without weight-bearing on the fractured bones. He believed that the stress of using the limb is one of the most potent factors in ensuring bony union. An important consideration in restoring a foot to normal function is the length and shape of the first metatarsal. Impaction of this bone in malposition must be very carefully corrected, and if there is angulation of its shaft, it is far better that it should be bent dorsalwards than plantarwards. Continuous traction to correct shortening may be necessary in fractures of metatarsals. Mr. Irwin drew attention to the great danger of forcible manipulation to mould fractured feet in a late stage when there was much swelling and œdema, for this might cause gangrene of the foot necessitating amputation. Gradual traction by Böhler's method was much safer than manual manipulation at this stage. During the late war, "march foot" in young recruits attracted considerable attention. It is known that this particular variety of painful foot is due to a fracture of one of the middle three metatarsal bones across its neck. Mr. Irwin finds this same fracture in nurses during the early months of their training. He attributes the injury to a sprain of the interossei followed by œdema and by decalcification of the metatarsals. Weight-bearing then cracks the weakest bone or that bearing the most strain. It is most important that immobilisation of the foot should be prolonged until it is firmly consolidated if recurrence is to be avoided.

THE NORMAL ELECTRO-ENCEPHALOGRAM

THE rapidity with which physiological discoveries are absorbed into clinical science sometimes prevents due attention being paid to the scientific significance of the discoveries themselves. The successful application of electro-encephalography to neurological diagnosis must not conceal either the empirical nature of the technique or the importance of experiments on normal subjects. A paper by Jasper and Andrews[2] shows how little is known and how much may yet be discovered about the electrophysiology of the normal human cortex. Using apparatus and methods almost identical with those developed in this country for the diagnosis of cerebral tumours and epilepsy, these American workers claim that there are at least two, and possibly three or more, distinguishable electrical rhythms in the normal brain, and that these rhythms are localised in origin. The "alpha" potentials, which were for some time called the "Berger rhythm," have a frequency of about 10 per sec., are inhibited by visual activity, and are most prominent in the occipital region. The 25 per sec. "beta" rhythm is more characteristic of the precentral cortex and is sensitive to inhibition by unexpected touching of the body. The "gamma" rhythm is even faster, and little is known about it except that it is rare. These potential rhythms seem to resemble in some ways the characteristic local action potentials described by Kornmüller[3] in animals, but the variability between individuals and in the same individual from time to time is very much greater in the human subject, and the hoped-for correlation between electrical rhythm, histological structure, and physiological function is still far from established.

The most striking property common to all these brain rhythms, at least the one most puzzling to the physician, is that they all—visual alpha, sensori-motor beta, problematical gamma, and pathological delta—seem to indicate varying degrees of rest on the part of the cortex. Perhaps, in order to distinguish them from the fading memories of text-book physiology, we should call them "inaction potentials."

BARBITURATE POISONING

THE barbitone group of hypnotics form a convenient if uncertain vehicle for the suicide, and in France there have been intermittent epidemics of their use for this purpose. Carrière and Huriez[4] of Lille saw 32 cases of barbiturate poisoning in the four years 1934–37 with 7 deaths. Of the persons concerned 27 took phenobarbitone, 2 Veronal, 2 Allonal, and 1 Dial; 25 were women and 7 men. They could be divided into three classes, according to the dose of drug taken: a "subcomatose" class who took from 1 to 2 grammes and recovered spontaneously after sleeping 10–20 hours; a "curable comatose" class who recovered with treatment after being comatose for 3–20 hours; and a "malignant" class who took from 6 to 11 grammes and died after a coma lasting 21–72 hours. The prognosis, then, depended largely upon the dose taken, though people have been known to recover after taking as much as 15 g. of veronal. Age and previous medical history did not seem important in this series, but the outcome was influenced by delay before treatment was started. The cured cases all received treatment within ten hours, whereas all but one of the fatal cases were treated later. Serious signs during the coma were: a temperature over 102° F.; a considerable increase in leucocytes, especially polymorphs; extensive chest complications; a severe fall in blood pressure; and signs of renal failure. One woman of 22, who died after taking 6 g. of phenobarbitone, had a temperature of 105° F., a white cell count of 40,000, including 90 per cent. polymorphs, and an extensive bronchopneumonia. Carrière and Huriez advise preliminary gastric lavage or apomorphine, then adrenaline or Coramine (3 c.cm. hourly intravenously) if there is circulatory depression, bleeding if there is cyanosis, and oxygen if there are pulmonary complications. In severe cases they give a 30 per cent. solution of alcohol intravenously every two hours. Though coramine and alcohol neutralise the effects of the barbiturates in animals, they have not been strikingly successful in man, and Carrière and Huriez pin their faith to strychnine. Where this can be given within

[1] Eastwood, W. J., *Brit. J. Surg.* 1938, **25**, 636.
[2] Jasper, H. H., and Andrews, H. L., *Arch. Neurol. Psychiat., Chicago*, January, 1938, p. 95.
[3] Kornmüller, D. E., Die bioelektrischen Erscheinungen der Hirnrindenfelder, Leipzig, 1937.
[4] Carrière, G., and Huriez, C., *Echo méd. Nord.* December, 1937, p. 687.

two or three hours, they say, a dose of 20–50 mg. of strychnine sulphate every 20 or 30 minutes will bring a patient out of coma in a few hours, though they admit that there is some danger of strychnine poisoning. One of their patients, however, died although she was treated within two hours and given a total of 785 mg. of strychnine.

Strychnine certainly cannot be regarded as a specific, and wider trial should perhaps be made of picrotoxin. The use of this remedy in chloral hydrate poisoning was suggested by the late Sir James Crichton Browne in 1875, and Maloney, Fitch, and Tatum (1931) found it more effective than strychnine in barbiturate poisoning of animals. Kline, Bigg, and Whitney[5] gave it successfully to a student of 20 who took thirty Amytal tablets, a total of 3 g., and became deeply comatose. His stomach was washed out and 23 doses of 0·003 g. of picrotoxin were given subcutaneously within the next sixteen hours, with glucose intravenously. After this period he began to move about and recovered uneventfully. He had shown, however, none of the signs that the French writers consider to be of serious import.

STERNAL PUNCTURE

In the last few years examination of bone-marrow removed by sternal puncture has become a routine in several hæmatological clinics. A valuable review of 246 cases studied by this method has been published by Vogel, Erf, and Rosenthal.[6] Their differential counts on a series of normal marrow samples closely agree with those of other observers. They conclude that sternal puncture is useful in the diagnosis of Gaucher's disease, myelomatosis, leishmaniasis, malaria, and carcinoma with generalised bone metastases, and particularly in aleukæmic types of leukæmia. They found it also of confirmatory value in leukæmia, leucopenic infectious monocytosis, agranulocytosis, pernicious anæmia, sprue, hæmolytic jaundice, polycythæmia, and aplastic anæmia. In hæmolytic jaundice the marrow is normoblastic, which allows a rapid differential diagnosis to be made in cases of chronic jaundice. Polycythæmia showed two interesting marrow characteristics—the erythropoietic elements were decreased in number, and the predominating cells were mature polymorphonuclear leucocytes. In conditions other than those mentioned a study of the marrow was not found helpful. Unfortunately from the paper the clinical differentiation between what the authors call leucopenic infectious monocytosis and agranulocytosis is not altogether clear, though from reading the case reports it appears that the former title is given arbitrarily to cases with agranulocytosis in the peripheral blood that recover and the latter to those that do not. They state that the number of nucleated marrow cells was normal in the benign type—in which also there is an increased number of myelocytes—but greatly diminished in the fatal form.

Where the monocytes originate is still obscure. It is of interest, therefore, that in this series of 246 patients monocytes were found in the marrow only twice, though 5 cases with an increase in the peripheral blood were studied. No apparent variation in the quality or quantity of cytoplasm of the megakaryocytes was found in 9 patients with thrombocytopenic purpura, and splenectomy had no effect on them though the peripheral platelets rose to normal. In infectious mononucleosis the marrow always showed an increase in lymphocytes. No correlation was found between the number of eosinophils in the peripheral blood and those in the marrow in a miscellaneous group of patients with eosinophilia. The illustrations to this study are not helpful, but a small monograph on the same subject by Schulten[7] has some excellent colour prints of the marrow pictures in different diseases.

All those who have experience of this method of studying patients with blood dyscrasias agree that in a proportion of cases it assists in diagnosis. It is clearly a useful means of analysing the marrow reactions in obscure conditions such as agranulocytosis and obscure anæmias as has been emphasised recently in our columns by Zanaty.[8]

MALE HORMONES IN GYNÆCOLOGICAL PRACTICE

The paper by Dr. Loeser on p. **373** raises a question related to one discussed in a leading article last week—namely, the suggested treatment of chronic cystic mastitis with œstrogenic hormone. The basis of such therapy is the observation in animals that an excess of œstrin in the blood depresses the gonad-stimulating powers of the pituitary, and thus leads to a decrease in the amount of œstrin secreted by the ovaries. Dr. Loeser has treated ten cases of menorrhagia, and two of chronic cystic mastitis, with testosterone propionate, and he thinks that the success achieved is similarly due to suppression of the gonadotropic activity of the pituitary and to a consequent reduction of ovarian secretion. That testosterone can in fact suppress ovarian activity and uterine bleeding has been shown by Zuckerman,[9] working on monkeys, and one part of Dr. Loeser's speculation thus has an empirical foundation. Observations published by Salmon[10] provide some factual basis for the second part of his speculation. Ovariectomised women, or menopausal women with failing ovarian function, excrete more gonadotropic hormone and less œstrogenic hormone than do normal women. Salmon investigated a patient, aged 46, whose ovaries and uterus had been removed at operation and who suffered from typical menopausal symptoms. He found that the injection of testosterone propionate gave considerable relief from the symptoms and also reduced the amount of gonadotropic hormone recoverable from the urine. Simultaneously the vaginal smear was transformed from the "anœstrous" to the "œstrous" type. These observations suggest—though they certainly do not prove—that testosterone propionate does in fact cause changes in the pituitary.

In considering the complicated reactions with which Dr. Loeser is dealing one must bear in mind that he provides no direct evidence that ovarian activity was suppressed in the patients he treated. Testosterone propionate does not necessarily have the same action on the ovaries of different species, and it is perhaps unsafe to transfer to women observations that have been made on monkeys. For example, McKeown and Zuckerman[11] have shown that in the rat the inhibition of uterine changes which the hormone causes is associated with luteinisation; and here, too, it is unknown whether or not

[5] Kline, E. M., Bigg, E., and Whitney, H. A. K., *J. Amer. med. Ass.* 1937, **109**, 328.
[6] Vogel, P., Erf, L. A., and Rosenthal, N., *Amer. J. clin. Path.* 1937, **7**, 436.
[7] Die Sternalpunktion als diagnostiche Methode. By Prof. Dr. Hans Schulten. Leipzig: Georg Thieme. 1937. Pp. 82. R.M. 18.
[8] Zanaty, A. F., *Lancet*, 1937, **2**, 958, 1365.
[9] Zuckerman, S., *Lancet*, 1937, **2**, 676.
[10] Salmon, U. J., *Proc. Soc. exp. Biol., N.Y.* 1937, **37**, 488.
[11] McKeown, T., and Zuckerman, S., *Proc. roy. Soc.* B, 1937, **124**, 362.

the ovarian change is an indirect one resulting from primary changes which have taken place in the pituitary. If, however, the fact that ovarian function and uterine bleeding can be suppressed in monkeys is accepted as a basis for clinical practice, certain possibilities are immediately suggested. In the first place, as Dr. Loeser has shown, uterine bleeding should be stopped by administration of the hormone, and it is of interest that the menorrhagia which he successfully treated had resulted both from uterine fibroids and from a hyperplasia of the endometrium. In the second place, it should be possible to stop follicular growth and ovulation, and there is the possibility that certain cystic conditions of the ovary could be relieved by the same means. Furthermore, mammary disorders which result from excessive œstrogenic stimulation would presumably be benefited by this form of treatment, and Dr. Loeser's two cases, which confirm the experience of Desmarest and Capitain,[12] give substance to this possibility.

The aim of all such treatment is, of course, the suppression of ovarian activity, and whether or not such suppression results secondarily from changes in the pituitary, it is clear that testosterone is a safer agent for bringing it about than œstrone; for, as we pointed out last week, testosterone, unlike œstrone, is not known to play any part in the production of cancer. Nevertheless, although no ill effects have as yet been described in the clinical use of testosterone in women, this substance might possibly have unwanted results in gynæcological practice. As Zuckerman has shown, it can cause masculinisation of the external genitalia in monkeys, and this response is even better seen in rats. Moreover, it has been demonstrated by Scipiades[13] and by Hamilton and Gardner,[14] working on rats, that the hormone has certain adverse effects when administered during pregnancy. Great care will therefore have to be taken in the gynæcological application of testosterone propionate. Since the experimental evidence promises well for the future of this form of therapy, it is encouraging to know that Dr. Loeser observed no harm after the administration of as much as 1500 mg. of the hormone to a woman over a period of seven months.

THE HANBURY MEDAL

AT a meeting convened for the purpose at the headquarters of the Pharmaceutical Society on Tuesday evening Mr. T. Marns, president of the society, formally presented the Hanbury medal to Prof. R. Wasicky, chief of the Pharmacognostic Institute of Vienna University, who then delivered his lecture on modern points of view and methods in pharmacognosy. Prof. Wasicky began his scientific career as a pupil of August v. Vogel and became an assistant under his successor Moeller. In 1920 he was appointed chief of the institute and from 1924 to 1926 he was dean of the medical faculty in the university. He is president of the Austrian Pharmacopœia Commission and was the first chairman of the International Association for the promotion of the production and utilisation of medicinal and aromatic plants. In 1935 an honorary degree was conferred on him by the Paris Sorbonne. Prof. Wasicky's research work covers a wide field. He has conducted many investigations into methods of drug assay; he has also made contributions to the development of microchemical methods for the identification of alkaloids and other principles of vegetable drugs. He has exerted a strong influence upon pharmacognosy through his text-books which are widely used. The Hanbury medal, it may be recalled, was founded in 1881 to commemorate Daniel Hanbury, an eminent British authority on materia medica. It is awarded periodically for promotion and prosecution of research in the chemistry and natural history of drugs, and among past recipients are research workers in Great Britain, Europe, and the United States.

[12] Desmarest, E., and Capitain, Mme., *Pr. méd.* 1937, **45**, 777 and 1109.
[13] Scipiades, E., *Proc. Soc. exp. Biol., N.Y.* 1937, **37**, 242.
[14] Hamilton, J. B., and Gardner, W. U., *Ibid*, p. 570.

PIGMENTATION AND STATURE

AN association between stature and hair and eye colour that might well have to be taken into account in using physical measurements as indices of nutritional well-being has been observed by M. A. MacConaill[1] in 2500 Sheffield male school-children. He divides the children into three groups—namely, blond (blond hair and blue eyes), brunette (brown or black hair and brown eyes), and heterochrome (all other combinations of hair and eye colour). In average stature the homochrome classes, the blond and brunette, do not differ significantly from one another. But both are taller at every age from 5 to 17 than the heterochrome group, and are also less variable in the stature of the individuals comprising their group. The mean difference between them and the mixed class is just over 1¼ in., or as much as half the amount that has been quoted as differentiating elementary and public school-children. The mean rate of growth over the whole period of years 5–17 does not differ between the groups, but the acceleration that accompanies puberty is rather greater with the brunettes and blonds than with the mixed group. For accurate estimates of the effects of dietary experiments or of daily environment it seems that we may now need a survey of pigmentary types in addition to the battery of physical, physiological, and psychological tests that falls to the normal lot of a modern school-child. It would be interesting to know whether, and if so to what extent, weight and facility for increasing weight are associated with pigmentation. For since weight and stature usually show an appreciable degree of correlation with one another, it seems inevitable that the former as well as the latter must bear some relationship to colour.

A NEW RESEARCH FELLOWSHIP

THE Medical Research Council have been entrusted with an annuity of £350 for twenty-five years, provided by the late Mr. Eugen M. Schlesinger and by Mrs. Schlesinger to establish a memorial to their daughter in the form of a Kathleen Schlesinger research fellowship. This is to be given for investigations into cysts of the brain or allied conditions, and will ordinarily be tenable at the National Hospital for Diseases of the Nervous System, Queen-square, London, for periods of from one to three years. Awards will be made by the Council with the assistance of a special advisory committee appointed in terms of the trust deed.

WE have to record the death on Feb. 8th, at the age of 97, of Sir JOSIAH COURT at his home at Staveley, Chesterfield. His report, published in 1891, on the eyes of coal-miners in Derbyshire, Durham, Forest of Dean, and Belgium, initiated the inquiry into the origin of miners' nystagmus, and was instrumental in obtaining better lighting in the mines.

[1] *Ann. Eugen., Camb.* January, 1938, p. 117.

SPECIAL ARTICLES

DIPHTHERIA—A PREVENTABLE DISEASE *

BY J. G. FITZGERALD, M.D. Ontario

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BEFORE the introduction of active immunisation against diphtheria, no substantial reduction in that disease was evident in the Dominion of Canada (FitzGerald 1928). Although diphtheria antitoxin was made freely available to practitioners by the public health authorities in almost all parts of the country, for prevention as well as for treatment, the morbidity-rates maintained their previous high levels.

This is not to say, however, that all efforts at control—isolation of cases and quarantine of contacts, separation of other members of the family, and prophylactic antitoxin—were entirely barren of results. The recorded morbidity-rates of diphtheria are the resultants of different influences in different periods. For example, environmental changes, such as urbanisation of the population, with greater opportunities for human contact, might well have caused a real increase in cases if there had been no control measures; the wider use of laboratory services may have revealed cases otherwise undiagnosed; the use of public health nurses and school nurses may have resulted in more complete notification; and the changing clinical conception of the disease may have included cases of a kind that would not have been included in earlier years. While correction cannot be made accurately for such factors, their possible influence on recorded rates cannot be neglected in making comparisons.

TABLE I—DIPHTHERIA DEATHS: CANADA REGISTRATION AREA * 1921–25

Age.	Number.	Per cent.	Age.	Number.	Per cent.
Under 1	271	5·8	0– 4	1932	41·7
1	306	6·6	5– 9	1723	37·2
2	397	8·6	10–14	611	13·1
3	486	10·5	15+	369	8·0
4	472	10·2	Total	4635	100·0

* As Quebec Province did not join the Registration Area until 1926, this Table does not include the data for that province.

Be that as it may, the case-fatality rates and the specific mortality-rates had been falling for over fifty years. But they were still high. From 1920 to 1924 the mortality ranged from 23·2 to 12·8 per 100,000 with 1200–2000 deaths, or an average of 1600, as the annual toll. Over 40 per cent. of that mortality was supplied by the 0–4 age-group as shown in Table I. In that period, throughout Canada, diphtheria ranked as the chief cause of death in the age-group 2–14, accounting for over 15 per cent. or 1 in 7 of all deaths in that age-group (FitzGerald 1930).

* Presented, in abstract form, at the Second International Congress for Microbiology (Sect. 8), London, July, 1936. Later data and references have been included for publication.

INTRODUCTION OF TOXOID

Not until 1925 was there general agreement among public health workers in Canada in respect of a suitable agent for immunisation. In that year, as a result of the work of Ramon, diphtheria "anatoxine" or formol toxoid, prepared in the Connaught Laboratories, University of Toronto, was distributed to the provincial and local departments of health throughout Canada. This was done after careful laboratory and clinical studies had demonstrated its merit on the basis of innocuity and immunising properties as a specific preventive against diphtheria.

Reaction test.—Early experience showed that toxoid causes unfavourable reactions when given to certain individuals. The reaction test, however, devised by our colleague Dr. P. J. Moloney, made possible the detection of persons who might show untoward reaction if given toxoid (FitzGerald 1926, Moloney 1926, Moloney and Fraser 1928). This has eliminated the fear of reactions and thus has greatly facilitated the wide use of toxoid. The reaction test consists of the intradermal injection of 0·1 c.cm. of suitably diluted toxoid. A positive reaction (redness) indicates specific sensitivity induced by previous association with the diphtheria bacillus or by artificial immunisation. A larger area of redness, or more particularly of induration, at the site is an indication of the likelihood of that individual showing an untoward sensitivity reaction if given toxoid (Burke 1930). Such "reactors" are found mainly among older children and adults. The majority of reactors possess a high degree of antitoxic immunity and the incidence of diphtheria in them is much less than in their unselected controls (Ross and McKinnon 1931). It must be emphasised, however, that a positive reaction test in any individual is not proof of immunity. Antitoxin titrations reveal that some reactors have no detectable antitoxin (<1/500 unit per c.cm. serum). Reactors may be readily immunised with diluted toxoid. In some instances the antigen in the test itself may be sufficient to complete the immunisation. The number of positive reactions which may be found depends on several factors: age, diphtheria history, and environment, and probably too on the material used. Wide variations in observations made in different places are therefore to be expected.

In Canada diluted toxoid has been used for the past twelve years, with advantage, as a control in the Schick test (Moloney and Fraser 1928).

LIMITATIONS OF THE SCHICK TEST

As the Schick test is used to a great extent in studies in diphtheria, especially in estimating the efficiency of various prophylactics, reference may be profitably made to certain of its limitations. The standards in various countries are not identical. For example, the international standard and the standards laid down by regulation under the Therapeutic Substances Act of Great Britain and by regulation under the Food and Drugs Act of the Dominion of Canada differ from those prescribed by regulations of the Treasury Department of the United States of America (administered by the

TABLE II—ANTITOXIN TITRES CORRELATED WITH INTERPRETATION OF SCHICK TESTS

Agreement of the six Schick readings.	Number.	Antitoxin titre.						
		<1/500	≥1/250 <1/100	≥1/100 <1/50	1/100	≥1/50 <1/30	1/30	>1/20
All positive	33	33	..	..	..	..	..	..
All negative	24	..	2	1	1	2	..	18
Non-interpretable	7	3	..	..	..	..	1	3
Frank disagreement	23	6	..	..	1	2	..	14
Total	87	42	2	1	2	4	1	35

United States public health service through the National Institute of Health).

In Table II is shown the disagreement found by using six different Schick tests in 87 individuals (Brandon and Fraser 1936). It is evident that among both those with high antitoxin content and those with no antitoxin (<1/500) there was frank disagreement in the results. The Table also shows that the lowest level of antitoxin associated with a Schick-negative state is about 1/250 unit. This is in agreement with the work of others.

In Fig. 1 are shown the results of six Schick tests done with six different products simultaneously in one individual who possessed more than 1/50 unit of diphtheria antitoxin per c.cm. of blood-serum (Brandon and Fraser 1936.) The lack of uniformity and the possibility of wrong interpretation need no further comment. Taylor and Moloney (1937) have analysed 15 Schick-test preparations in regard to toxicity and combining power and correlated the results with the reactions obtained in individuals whose blood-serum antitoxin was titrated. Their observations indicate clearly the desirability of revising Schick-test requirements.

This must not be construed as undue criticism of the Schick test. It is an instrument which has yielded invaluable information in the epidemiology of diphtheria. Its inherent limitations including its fallacies must be understood, however, so that unwarranted conclusions be not drawn from the results obtained.

COMPARISON OF ANTITOXIN RESPONSE TO VARIOUS ANTIGENS

In determining the antigenicity of various prophylactic preparations and in differentiating between them, the Schick test may be of little value (Fraser and Halpern 1935a). While it will show a difference between a very poor prophylactic and a good one, it will not differentiate between two of a higher order of efficiency. For such differentiation, titrations of the blood antitoxin, as recommended by Fraser and Halpern (1935b, 1937), give much more reliable and complete information.

For full details in this connexion reference should be made to the original publications. In Table III are shown the antitoxin responses induced by various prophylactic procedures. It must be emphasised that these comparisons were made in children whose complete susceptibility was established before being given the prophylactic. In Group 1 the Schick test and reaction test were used to select the children and all were frankly Schick-positive and reaction-test-negative. In the other groups, antitoxin titrations of blood-serum showed that all had initially less than 1/500 unit. This is, we think, most significant, as it is essentially for such individuals that prophylaxis is necessary. The suggestion that one or two doses of alum-precipitated toxoid will give as satisfactory antitoxin response as that induced by three doses of unmodified toxoid is not borne out by these results.

TABLE IV—COMPARISON OF ANTITOXIN TITRE AFTER

A = One dose alum-precipitated toxoid
B = Three doses unmodified toxoid
Original titre <1/500

Per cent. with—	After—					
	10 wks.		10–14 mths.		22–25 mths.	
	A	B	A	B	A	B
1/100 or > units ..	68	91	22	97	15	86
1/50 or > units ..	40	91	14	75	15	76
Number of children	40	35	36	32	26	21

Even more striking is the difference found in the duration of high antitoxin content, as shown in Table IV. It is evident that at approximately one

TABLE III—DIPHTHERIA ANTITOXIN RESPONSE TO ANTIGENS IN CHILDREN

Group.	Antigen.	Number tested.	Percentage distribution by antitoxin levels (units) three months after toxoid.							
			1/500 and >	1/250 and >	1/100 and >	1/50 and >	1/20 and >	1/10 and >	1/5 and >	1/2 and >
1	3 doses .. 15–20 Lf (2 c.cm.)	108	99	99	96	94	89	76	52	21
2	2 „ .. 50 Lf (2 „)	105	80	70	60	45	35	—*	15	5
3	2 „ .. 20 Lf (2 „)	48	75	60	40	27	8	—*	2	0
4	2 „ .. 20 Lf (1·5 „)	48	60	50	29	17	15	—*	15	4
5	1 dose alum ppt. (1 „)	40	97	—*	67	40	—*	15	—*	12
6	2 doses „ (1 „)	36	97	97	97	86	86	39	25	—*

—* Not tested at this level.

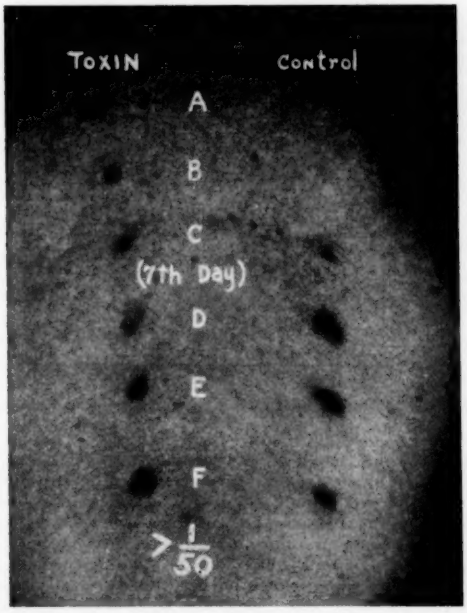

FIG. 1.—Results of Schick tests done simultaneously with six different products.

year after being given three doses of toxoid, over 90 per cent. of 32 children still had 1/100 unit or more per c.cm. of blood-serum in contrast to but 22 per cent. retaining this level in a group of 36 children who had been given one dose of alum-precipitated toxoid. At a two-year period the percentages showing 1/100 unit or more of antitoxin are 86 and 15 for those given three doses of unmodified toxoid and one dose of alum-precipitated respectively. The numbers of children in this comparison are not great, but the difference is far beyond chance variation.

GRADUAL DECLINE IN ANTITOXIN CONTENT AFTER VACCINATION

It is gratifying to learn from Fig. 2 that the antitoxin content induced by three doses of toxoid is fully comparable and indeed slightly above that found in a sample of naturally immune persons. But it is as important, though less pleasant, to realise that as time passes after immunisation, the level of antitoxin tends to fall. Fraser and Halpern (1937) have done serial antitoxin titrations of the blood at various time intervals in a large group of children given three doses of toxoid. Their results are summarised in Table V.

It is obvious that antitoxin is being lost by the group as a whole, the percentages in the higher antitoxin categories becoming successively smaller. The rate of loss, however, becomes less rapid as time passes. At the two-year interval the average antitoxin content of the group as a whole is approximately 50 per cent. of the former level. It will be realised that marked variations in the rate of loss of antitoxin will be found among individuals and that the rate may be changed significantly by the amount of diphtheria in the environment. In certain instances, if such chance contact with diphtheria bacilli be sufficient, the antitoxin may be increased, as shown by Fraser and Halpern. It must be pointed out that the results shown in Table V were obtained from the titrations of blood-sera of children living in an environment almost free from diphtheria. Only

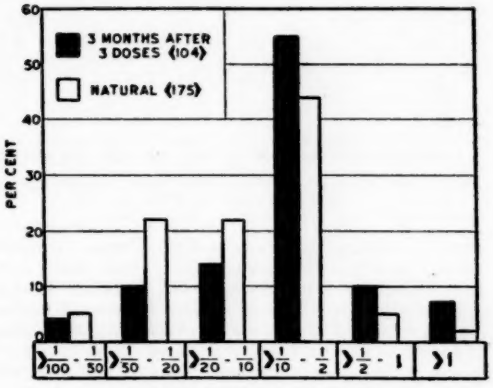

FIG. 2.—Antitoxin content of blood.

in five instances was there evidence of increase in antitoxin content during the time of observation.

In a word, from the data quoted, it can be said that three doses of toxoid yield a higher level of antitoxin response and thus more durable antitoxic immunity than any other procedure compared to date; that the level induced by three doses of antitoxin is fully comparable with that found in natural immunes, but that this level tends to fall as the years pass following immunisation.

TABLE V—DIPHTHERIA ANTITOXIN AT INTERVALS AFTER THREE DOSES OF TOXOID

(629 sera of 244 children)

Interval after toxoid (months).	Number tested.	Percentage distribution by antitoxin levels.										
		<1/500	>1/250 to 1/250	>1/250 to 1/100	>1/100 to 1/50	>1/50 to 1/20	>1/20 to 1/10	>1/10 to 1/5	>1/5 to 1/2	>1/2 to 1	>1 to 2	>2
3	108	1	..	3	4	9	14	30	23	9	6	1
6	103	..	..	2	6	14	17	26	24	6	4	1
9	100	..	..	5	5	15	20	28	18	3	4	2
12	88	..	..	6	7	18	24	25	16	2	1	1
18	103	..	1	8	10	19	24	26	7	2	1	2
24	104	..	2	7	12	25	24	17	8	2	..	3
36	23	..	..	4	13	13	44	9	13	..	..	4

PROTECTION AGAINST DIPHTHERIA AFFORDED BY TOXOID

It is pertinent now to inquire into the actual value of toxoid in protecting children against diphtheria. For this purpose we have the amount of the diphtheria that occurred in children given one, two, and three doses of toxoid, in comparison with the diphtheria in their school-mates in Toronto public schools under the same exposure, as shown in Table VI (Ross and McKinnon 1931).

These observations were made when diphtheria was still very prevalent and represent therefore the results under conditions of high exposure. The group numbered over 27,000 children, while the controls

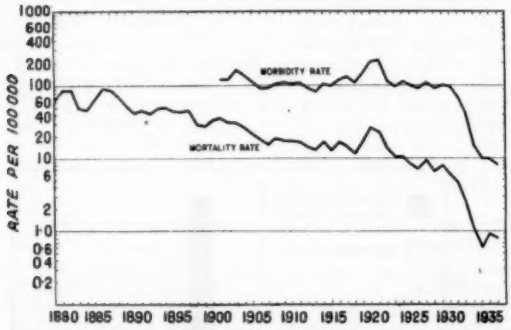

FIG. 3.—Diphtheria in Ontario, 1880–1936. (Morbidity- and mortality-rates per 100,000.)

were the balance of the school population, approximately 90,000. The inadequacy of one dose is at once apparent. The advantage of a second dose in immunisation is evident in the greater reduction (74 per cent.) of diphtheria in those given two doses of toxoid. The superiority of three doses is evident in the 90 per cent. reduction of cases in the 16,829 children given three doses of toxoid in the 1927–30

TABLE VI—REDUCTION IN DIPHTHERIA IN SCHOOL-CHILDREN SUBSEQUENT TO TOXOID

Toronto Public Schools, 1926–30

Doses of toxoid.	Cases.		Percentage reduction.	Deaths.
	Estimated.*	Actual.		
One dose ..	34	24	29	3
Two doses ..	200	52	74	2
Three „ ..	222	23	90	0

* At rate in controls (school-mates) under same exposure, corrected for age, &c.

period. The difference in the results of two doses and three doses is beyond chance variation and is statistically significant. Further, and of importance, this difference is in general agreement with the difference in antitoxin responses induced by two or three doses of toxoid.

These observations were extended to include other school-children given three doses of toxoid subsequent to 1930, making a total of 46,000, with the results shown in Table VII (McKinnon and Ross 1935). In each year the reduction in diphtheria in the group given three doses of toxoid approximated 90 per cent. In other words, this group suffered but 10 per cent. of the rate of diphtheria suffered by their seat-mate controls. The study suggested, however,

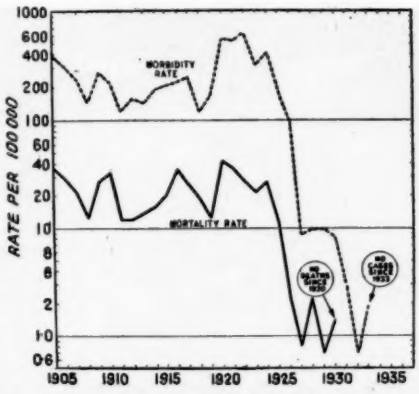

FIG. 4.—Morbidity and mortality from diphtheria in Hamilton, 1905–36.

that as time passed after vaccination there was some falling off in the degree of protection. This is entirely in keeping with the falling off in antitoxin content as shown by Fraser and Halpern and is additional evidence that immunity to diphtheria is a function of antitoxin. As is shown in Figs. 4 and 5, subsequent to 1932 the paucity of diphtheria in Toronto yielded figures so small that deductions from them in regard to protection afforded by toxoid to vaccinated individuals were impractical.

CONTROL OF DIPHTHERIA MORBIDITY AND MORTALITY

Gratifying as is the 90 per cent. reduction in diphtheria in those given three doses of toxoid, as compared with their unvaccinated school-mates, the

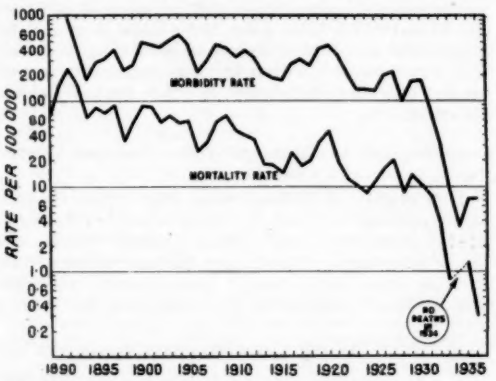

FIG. 5.—Morbidity and mortality from diphtheria in Toronto, 1890–1936.

actual benefit is not confined to those vaccinated, but is reflected in a reduction in diphtheria among their associates.

From 1925 to 1936 inclusive, sufficient toxoid has been distributed from the Connaught Laboratories for the immunisation of over three million persons in Canada. It is not known precisely how much has been used, but the effect is evident in the strikingly lower rates of diphtheria morbidity and mortality in various cities and provinces in Canada. Figs. 3 to 6 are illustrative.

In Table VIII and Fig. 3 the history of diphtheria in the province of Ontario is briefly recorded. The

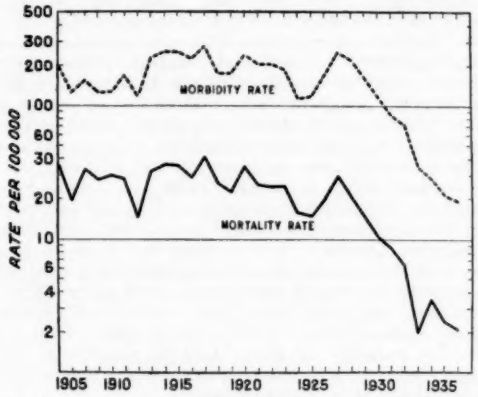

FIG. 6.—Morbidity and mortality from diphtheria in Montreal, 1906–36.

population has increased from under two million in 1880 to over three and one-half million in 1936. In 1916 the Provincial Board of Health of Ontario provided for completely free distribution of diphtheria antitoxin. There were available at the time, for physicians in Ontario, very satisfactory public health diagnostic laboratory facilities to aid in the diagnosis of diphtheria. Thus for more than three millions of persons the scientific weapons available twenty years ago, for the prevention and treatment of diphtheria, were readily accessible. Furthermore, physicians and the general public were repeatedly urged to take advantage of these facilities. Despite that fact, as has already been indicated, the free use of diphtheria antitoxin, while it may have influenced diphtheria mortality and case-fatality rates, showed little or no effect on the absolute volume of recorded diphtheria morbidity, and the essential lack of control of the disease is seen in the return to the high mortality-rate of over 25 per 100,000 in 1920 and in the sustained high level of recorded morbidity, even after allowing for changing influences, for nearly thirty years. Then there is a precipitous decline such as had not occurred in the previous thirty years for which morbidity records are available, or in the previous fifty years for which mortality records are shown. From a rate of 97 in 1930, morbidity fell to 10 per 100,000 in 1934, and from a rate of 6 per 100,000 in 1930—the lowest on record till that date—mortality fell to 0·6 per 100,000 in 1934. This change has followed the extensive use of toxoid. The abruptness of the change in the picture, coupled with the established efficiency of toxoid, leaves no room for doubt that the change is due to active immunisation. Any other hypothesis to explain the change is superfluous. The fact that diphtheria has declined proportionately more than might have been anticipated from the number given toxoid is not difficult of explanation. Reducing cases in the immunised reduces foci of infection, spreaders of disease, in the group as a whole, so that the non-immunised benefit indirectly; this makes the control of diphtheria eminently practical. Further evidence of this is presented later in this paper.

TABLE VII—REDUCTION IN DIPHTHERIA IN CHILDREN GIVEN THREE DOSES OF TOXOID

Toronto Public Schools, 1927–32

Year.	Cases.		Percentage reduction.	Deaths.
	Estimated.*	Actual.		
1927–28 ..	25	1	96	0
1928–29 ..	84	7	92	0
1929–30 ..	113	15	87	0
1930–31 ..	133	14	89	0
1931–32 ..	105	3	97	0
1927–32 ..	460	40	91	0†

* At rates in controls under the same exposure, corrected for age, &c.

† To the end of December, 1937, there has been but one death from diphtheria in any child given three doses of toxoid in Toronto. This occurred in September, 1935, in a child 6¼ years old, who had been given three doses of toxoid 5 years previously.

TABLE VIII—DIPHTHERIA—ONTARIO. 1880–1936

Year.	Deaths.	Mortality-rate.*	Year.	Cases.	Deaths.	Mortality-rate.*	Morbidity-rate.*	Case-fatality rate.†
1880	1251	66·0	1901	2627	772	35·4	120	29·4
1881	1704	88·4	1902	2696	676	30·5	122	25·1
1882	1708	87·8	1903	3599	687	30·5	160	19·1
1883	976	49·7	1904	3045	608	26·6	133	20·0
1884	929	46·8	1905	2641	503	21·7	114	19·1
1885	1282	64·0	1906	2116	423	18·0	90	20·0
1886	1833	90·7	1907	2172	380	15·9	91	17·5
1887	1786	87·6	1908	2477	450	18·6	102	18·2
1888	1459	70·9	1909	2635	430	17·5	107	16·3
1889	1101	53·0	1910	2559	435	17·5	103	17·0
1890	893	42·6	1911	2631	423	16·7	104	16·1
1891	952	45·0	1912	2340	371	14·4	91	15·8
1892	890	41·9	1913	2194	339	13·0	84	15·4
1893	1044	49·1	1914	2772	443	16·7	105	16·0
1894	1075	50·3	1915	2719	341	12·7	101	12·5
1895	942	44·0	1916	3212	461	16·9	118	14·3
1896	925	43·1	1917	3590	396	14·3	129	11·0
1897	976	45·3	1918	3093	335	11·9	110	10·8
1898	634	29·3	1919	4261	475	16·7	149	11·1
1899	599	27·6	1920	5940	745	25·7	205	12·5
1900	738	33·9	1921	6313	653	22·3	215	10·3
			1922	3529	411	13·8	118	11·6
			1923	2935	316	10·4	97	10·8
			1924	3473	322	10·5	113	9·3
			1925	3031	251	8·1	98	8·3
			1926	2818	227	7·2	90	8·1
			1927	3346	297	9·3	105	8·9
			1928	3918	213	6·6	90	7·3
			1929	3261	262	8·0	100	8·0
			1930	3198	202	6·1	97	6·3
			1931	2368	157	4·6	69	6·6
			1932	1496	89	2·6	43	5·9
			1933	529	40	1·1	15	7·6
			1934	371	23	0·6	10	6·2
			1935	361	33	0·9	10	9·1
			1936	290	31	0·8	8	10·7

* Per 100,000. † Per 100 cases.

Hamilton, Ontario, a city of 150,000 population, was the first city of that size in Canada to control effectively diphtheria (Roberts 1931). The achievement of Dr. James Roberts, medical officer of health of Hamilton, has been a fine incentive to others. The record of this control is shown in Fig. 4. There have been no deaths since 1930 and no cases since 1933. This record speaks for itself.

Fig. 5 shows the history of diphtheria in Toronto, Canada, a city of approximately 650,000 population. Since 1926, 104,000 children have been given three doses of toxoid by physicians of the Department of Public Health. It is estimated that 13,000 children have been given toxoid by their own physicians. The effect of this continued immunisation is shown in the abrupt change in diphtheria, the morbidity-rate falling from 164 per 100,000 in 1930 to 3·5 in 1934. In pre-toxoid years the annual toll was 45 to 98 deaths, an average of 65 from 1921 to 1925. For a period of fifteen months, from January, 1934, to

March, 1935, not one death from diphtheria occurred in the city.†

The records of smaller cities, for example Brantford, Ontario, and St. Catharines, Ontario, show even more satisfactory control of the disease. Extracts from the annual reports for 1936 of the medical officers of health, Dr. W. L. Hutton of Brantford, and Dr. D. V. Currey of St. Catharines, are self-explanatory.

TABLE IX—DIPHTHERIA, TORONTO

Year.	Cases.	Deaths.	Number examined.	Positive swabs.	Summation of persons immunised.
1926	1,098	90	13,231	2,564	..
1927	1,223	114	12,286	1,661	80
1928	593	50	9,354	827	12,492
1929	1,030	82	16,542	2,754	17,564
1930	1,085	66	13,501	2,109	18,954
1931	564	49	9,728	1,086	35,280
1932	180	22	6,760	258	57,890
1933	58	5	5,077	86	72,367
1934	22	0	4,516	28	85,870
1935	46	8	4,322	56	92,918
1936	48	2	4,307	80	104,449

Population { 1926 .. 556,691 ; 1936 .. 645,162

Brantford, Ontario (population in 1936: 31,382).—"The policy of offering free toxoid treatments for the prevention of diphtheria continues to keep this city free from diphtheria. No Brantford child has suffered from this disease since Nov. 18th, 1930."

St. Catharines, Ontario (population in 1936: 27,000).—"It is over eight years since one of our residents died from diphtheria."

Montreal, Quebec, a city of nearly 1,000,000 population, has experienced a similar decline in diphtheria following the extensive use of toxoid, as shown in Fig. 6.

Fig. 7 is given to show that every province of Canada has shared, though not equally, in the decline in diphtheria following the use of toxoid.

REDUCTION IN THE INCIDENCE OF CARRIERS

It has been suggested that specific immunisation against diphtheria may occasion an increase in the carrier-rate of virulent diphtheria bacilli in any community. Deadman and Elliott (1933) showed that the experience in Hamilton, Ontario, was not at all in conformity with this suggestion. In 1920, 8261 cultures were examined for the diphtheria bacillus in Deadman's laboratory; 1040 were positive. In 1921, 9645 were examined and 1234 were positive. These data were typical of that time. In 1932, 3929 were examined and 85 (from 12 individuals) were positive. In 1934, out of 3817 examined, none were positive. Again in 1936, out of 3949 examined, none were positive.

† In the calendar year 1937, for the second time, no diphtheria death was reported in Toronto.

From May, 1934, to June, 1936, surveys were made in Toronto in which approximately 7800 nose and throat cultures from the school-children were examined (Fraser and Halpern 1937). Only 4 were found to contain virulent diphtheria bacilli. In another group of 999 children in an adjacent municipality, partly urban and partly rural, only 2 diphtheria carriers were discovered. In surveys of 1774 school-children in Montreal in 1935–37, only 2 carriers were detected. Table IX shows the numbers of positive cultures found in routine work in the laboratories of the Department of Public Health in Toronto. It is evident that in spite of a much greater number of cultures examined in relationship to the number of cases and a much more diligent search of the population, the number of carriers found showed very striking reductions. There is thus no evidence in these data in support of the suggestion that immunisation of part of a community increases the hazard of diphtheria.

SUMMARY AND CONCLUSIONS

Prior to the use of toxoid there was no effectual control of diphtheria in Canada. In spite of the free distribution of antitoxin for prevention as well as treatment, recorded diphtheria morbidity persisted at its previous high levels, and mortality, though falling, still presented one of the most important public health problems.

The reaction test, as devised by Moloney, practically obviated the hazard of reactions and thus facilitated the wide use of toxoid.

Requirements for the Schick test are in need of revision and standardisation. It is not infallible and its limitations should be recognised.

For determining the antigenicity of and differentiating between prophylactics the Schick test may be of little value. Antitoxin titrations give more complete and reliable information.

Titrations of the blood-serum of children who initially had no antitoxin and were then submitted to various immunisation procedures show that three

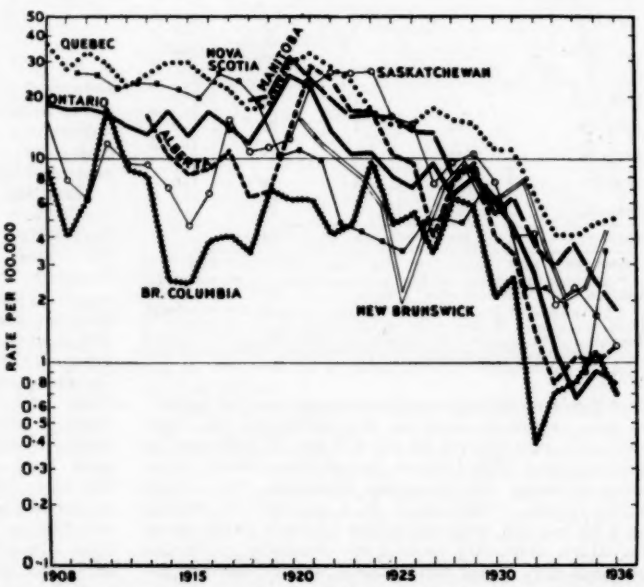

FIG. 7.—Diphtheria mortality-rate in provinces of Canada, 1908–36.

doses of unmodified diphtheria toxoid induced a higher antitoxin response than any of the other procedures compared—namely, two doses of unmodified diphtheria toxoid, one dose of alum-precipitated toxoid, and two doses of alum-precipitated toxoid. Titrations of blood-serum of vaccinated children indicate a loss in antitoxin as time passes.

Field studies show that the reduction in diphtheria, in those vaccinated with two doses of toxoid, is, like the antitoxin response, less than the reduction in those vaccinated with three doses and that the diphtheria occurring in the latter group is reduced by approximately 90 per cent. as compared with that found in school-mates under the same exposure.

Records show striking declines in diphtheria morbidity and mortality and in the incidence of carriers in various cities and provinces in Canada following the wide use of toxoid.

The abruptness of this decline in diphtheria morbidity and mortality and in the incidence of diphtheria-carriers in Canada following the extensive use of toxoid, the absence of any comparable diminution in the number of cases or of deaths from diphtheria before the use of toxoid, and the demonstrated efficiency of toxoid in preventing diphtheria in those vaccinated leave no doubt that the decline is due to immunisation.

The extent of the decline in several of the large cities and in certain of the provinces of Canada shows indubitably that diphtheria is a preventable disease.

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MEDICINE AND THE LAW

Borrowing a Doctor's Name

THE disability which prevents an unqualified practitioner from signing certificates sometimes forces his hand and drives him into illegality. In a case at the Marylebone police-court on Jan. 21st it appeared that William Thomas Robertson, a chemist's assistant, known in the district as "Dr." Robertson, had attended patients and, amongst other instances, had been called in to treat a child suspected of having diphtheria. One of his patients, whom he treated for influenza, was a civil servant. The patient asked for a medical certificate to send to the head of his department. Robertson then sent a certificate signed "A. C. Livingstone, F.R.C.S., L.R.C.S. (Edinburgh), and L.F.S." Whether Robertson had deliberately adopted the name of a registered medical practitioner or not, inquiry showed that there was a Dr. Livingston but that the spelling and degrees on the medical certificate did not correspond with those of the doctor in the Medical Register. Robertson was summoned for falsely pretending to be a doctor. He pleaded guilty and was fined £10 with £2 2*s*. costs. The defendant was not even a qualified chemist and druggist, having failed in the examination. Giving evidence on his own behalf, he stated in mitigation that at any rate he had never charged anybody a fee.

Deaths in Maternity Home

The Surrey county council reviewed last week the circumstances of the death of two maternity patients from puerperal fever at the Melrose Nursing Home, Sutton. An account of the inquest and of the criticisms contained in the jury's riders was printed in this column on Jan. 15th (p. 157). The maternity and child welfare subcommittee interviewed the council's deputy inspector of midwives, Miss Mander, and exonerated her from all blame. The subcommittee found that Miss I. L. Gibson, the keeper of the home, was at fault in the following specific points. First, she was to blame in allowing patients to enter the home without previous warning to them or to their doctors of the existence of a case of puerperal pyrexia in the home. Secondly, she failed in her duty as a midwife to notify the council that she had been in contact with infection. Thirdly, she omitted to disclose to the deputy inspector of midwives the fact that puerperal pyrexia had occurred. Fourthly, she allowed the night nurse to attend several patients, some of whom were suffering from puerperal pyrexia. On these findings the public health committee recommended, and the county council approved, the cancelling of Miss Gibson's registration. The council also approved a recommendation that the failure of the doctor in attendance on one of the patients to notify the Sutton and Cheam borough council of the occurrence of a case of puerperal pyrexia at the home should be drawn to the borough council's attention.

The case is one of a series which indicates the need of drastic overhaul and close supervision of the arrangements in maternity homes.

IRELAND

(FROM OUR OWN CORRESPONDENT)

DEFENCE OF THE VOLUNTARY HOSPITAL

IF one may judge from the speeches at the charter day dinner of the Royal College of Surgeons last Saturday, following on the address by Prof. Henry Moore, to which I referred a fortnight ago, the anxiety of those connected with the voluntary hospitals in Ireland is increasing rather than diminishing. Some two and a half years ago the Hospitals Commission, the body appointed by the Minister of Local Government and Public Health to advise him in regard to the distribution of the Sweepstakes Funds, advised, inter alia, that there should be four modern hospitals of 500 to 600 beds each established in Dublin. These hospitals were to be got by the separate development of three of the larger hospitals and by the amalgamation with one of them of the smaller. Last spring, speaking in the Dáil, the Minister declared that the voluntary hospitals "had, especially and in all justice, a right to primary consideration when distributing the Hospitals Sweepstakes Funds." During the last year or two, however, a rival scheme has been put forward mainly by certain members of the local authorities, who declare that the necessary funds should be supplied from the Sweepstakes Funds to establish a municipal hospital. The decision of the Minister between these two

alternatives has been so long delayed that those interested in the voluntary hospitals have become anxious.

Last Saturday, in replying to the toast of the Royal College of Surgeons in Ireland, the president, Mr. A. A. McConnell, discussed the subject at some length as one of great importance to the College, the profession, and the public. He asked to whom should the grant be given? To the voluntary hospital authorities, who had founded and managed the existing hospitals, kept them equipped with up-to-date apparatus, and turned out doctors second to none in the world; or to the municipal authorities, who had never run a modern hospital and had never tried to run a modern hospital? There had been a local authority's hospital in Dublin for many years, he said. Why was it not the best in the city? He suggested it was because the municipal authorities only thought it of importance when they thought they could get the money given to them. Why did the voluntary hospitals want to be enlarged—why did they oppose a municipal hospital? The members of the staffs would have to do more work, they would get not a penny for it, and they would submit to what every medical man hates like the devil—some degree of departmental control. But they believed that the future of medicine, the future of the universities, the future of the colleges, and the future of the sick poor in the city largely depended on Dublin having her hospitals run by people who would run them for the love of it and who were not engaged in running multitudes of other activities and institutions.

Dr. Robert J. Rowlette, who proposed the toast of the College, was equally emphatic. He said that the voluntary hospitals were quite content to go on giving gratuitous treatment to the poor, provided the bare maintenance charges were met. There was no proposal to pay the visiting staff. On the other hand, a hospital dependent on the rates had to pay for medical attendance as well as maintenance. The advantages of the voluntary system, however, were deeper than matters of pounds, shillings, and pence. They were, in brief, efficiency, progress, encouragement of research, opportunities for education, and, above all, the best individual attention to the patient given freely by the leading physicians and surgeons of the country. He would be content to leave to any working man in Dublin the choice between treatment in a voluntary hospital and in a public hospital under the charge of a public authority. The choice, in Dr. Rowlette's opinion, is between progress and stagnation.

In its first leading article the *Irish Times* of last Monday remarks that it is high time that public opinion in Ireland should be mobilised in favour of the voluntary hospitals, which are among our people's most valued possessions. It is to be hoped that these clear expressions of professional and public opinion will have their effect on the mind of the authorities.

NOMINATING BODIES FOR THE SENATE PANELS

The constitution of the new Senate of Ireland contemplates election from certain vocational panels, and the right of nominating to these panels was to be conferred on bodies regarded as having a certain vocational authority. The list of approved bodies was published last week and has caused a good deal of comment. It is difficult to discuss the principle which underlies the selection. Certain medical bodies applied for registration, but the only one the claim of which is admitted is the Royal College of Surgeons in Ireland. It has been admitted to registration for the "cultural and educational panel," while the applications of the Royal College of Physicians of Ireland, the Royal Academy of Medicine, and the Irish Medical Union—the representative body of the medical profession of the country and comprising some 70 or 80 per cent. of its members—have been rejected. It is understood that the Irish Medical Registration Council did not apply for registration, believing that its entrance into political matters was undesirable. On the other hand, the Dental Board, with similar functions, applied for and was granted registration. As the universities have direct representation in the Senate they did not apply for registration as nominating bodies.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

MIDWIFERY AT DUNDEE

Prof. John McGibbon retired from the chair of gynæcology and midwifery at Dundee in 1936. There has been some concern about the appointment of a new professor, for it seems that the university court and the town council have been in consultation together regarding the possibility of transferring the activity of the new professor from the Dundee Royal Infirmary to the municipal hospital at Maryfield. The Dundee Royal Infirmary, however, is the centre of maternity teaching in the district and about half the births in the city are annually attended there. Last year the births numbered 1115 indoor and 544 outdoor, and the proposal to transfer the new professor to Maryfield is, therefore, in some quarters looked on as an attempt by the town council and the university court to develop a new maternity centre not only under their own control but to some extent at the expense of the Dundee Royal Infirmary.

In Scotland, as elsewhere, there is an unfortunate rivalry between municipal and voluntary hospitals and in some instances the municipal authorities have enlisted the support of the local university authorities to improve the status of their hospitals. The result in some instances has been that the university authorities have appeared to take more interest in municipal hospitals than in the old-established voluntary hospitals that are still the centre of medical teaching. It is well known, however, that the management of the voluntary hospitals is of a standard that can hardly be improved on. It seems to the onlooker deplorable that any body should adopt an attitude or a policy that in any way could handicap the valuable work that the old-established institutions are doing.

Doubt has often been expressed as to whether municipal authorities constitute the most suitable body for controlling the non-voluntary hospitals. The most comprehensive and successful medical service in Britain, if not in the world, is the Highlands and Islands medical service. It is managed to the complete satisfaction of the medical men who take a part in it, and this service is quite independent of the local municipal authorities. In fact those who play a part in the service are more than anxious to avoid any interference by the local municipal bodies.

HIGHLANDS AND ISLANDS MEDICAL SERVICE

At a meeting of the Edinburgh Medico-Chirurgical Society last week Dr. Alexander Shearer described the remarkable and comprehensive Highlands and Islands medical service with whose development he has been closely related. He explained how the scheme

enabled the humblest home in any part of these districts to obtain medical attention at the low uniform fee of 5s. for the first visit and 3s. 6d. for subsequent attendances. The doctor often has to travel great distances, but the aim of the scheme is to relieve the patient of paying for the expense and time involved by the difficulties of transport. A grant of £42,000 is made annually by Parliament to the fund of the medical service and in 1929 it included 155 doctors and 210 nurses under the scheme. Provision for specialist services has also been arranged, and fully qualified surgeons are appointed to work at the various hospitals that have been built. Recently a consulting physician has been appointed to the Northern Infirmary, Inverness; and an air ambulance service and wireless telephony have enabled the removal of seriously ill patients to hospital from isolated districts and islands. The scheme has also made it possible for doctors to make a reasonable income in districts that previously were unable to support any form of medical service. The striking success of the Highlands and Islands medical service has resulted in many other countries studying it, and similar services have been formed not only in the United States but also in India. The recent report by the committee on the Scottish health services states that "Our view of the Highlands and Islands medical service is that it has fully justified its existence and has returned full value for the cost. In our view it has brought great benefit to the people of the Highlands and Islands and is administered in an atmosphere of sympathy and interest between the central board and the doctors, nurses, and other parties, to the satisfaction of all concerned."

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

A FEDERAL HEALTH DEPARTMENT

THE expediency of establishing a department of health is now before Congress. It has been urged by American physicians since 1875 that such a unit should be set up, with a secretary at its head and a voice in the cabinet. The exercise of authority in the field of health has given rise to an extensive and powerful group of federal health services, scattered throughout the executive departments and independent agencies of the Government, without integration and without a common directing head, and spending every year, it is estimated, more than a hundred million dollars. Several governmental committees have recently been appointed to study the activities of the various departments, bureaux, and boards of the executive branch of the Government to determine whether they conflict with or overlap others, and to recommend coördination of interests. The President's committee on administrative management now proposes to create a department of social welfare as a means of bringing under one head these widespread interests. The board of trustees of the American Medical Association at its meeting early last year recommended the consolidation in a single department of all medical and health activities of the Government, under the supervision and direction of a competently trained physician, experienced in executive administration. The department of welfare proposed by the committee on administrative management, however, cannot fulfil the recommendations of the medical profession, in that it would necessarily have such diverse interests as (1) the public health, safety, and sanitation, (2) the protection of the consumer, (3) the cause of education, (4) the relief of unemployment and of the hardship and suffering caused thereby, (5) the relief of the needy and distressed and the assistance of the aged, (6) the relief and vocational rehabilitation of the physically disabled, and (7) in general the coördination and promotion of public health, education, and welfare activities. Federal interest in the public health, as measured by money expended annually, exceeds its interest in commerce, justice, labour, and affairs of State, all combined. Hence to organise the health activities of the Government into a mere section of a department, created for that purpose but interested in many and varied other activities, would only hamper the development of federal activities in the field of health and delay the organisation of a proper federal agency. The bureau of legal medicine and legislation of the American Medical Association, in its study of this question, says: "As between assembling health activities in the proposed composite Department of Welfare and assembling them in an existing department, the latter course would be preferable, for it would be less likely to retard the development of the organization that must ultimately result, a Department of Health with a secretary in the cabinet."

FUNDS FOR POLIOMYELITIS CAMPAIGN

The National Foundation for Infantile Paralysis recently set up by President Roosevelt initiated a nation-wide campaign on Jan. 17th, which ended with the fifth annual celebration of the President's birthday on Jan. 29th. The first birthday ball in 1934 yielded just over a million dollars, all of which went to the Georgia Warm Springs Foundation. In the next three years 70 per cent. of the funds were retained by local communities for infantile paralysis work, and the remainder went to research. No definite goal has been set for the 1938 campaign, but a "founder's plan" hopes to enrol two million persons at a dollar each. This year all the money will be turned over to the new foundation and will be used in four types of activities: for scientific research on the disease; for emergency aid in epidemics; for after-care of victims; and for allotments to orthopædic centres, hospitals, and clinics for specific programmes within individual communities.

BIRTHS AND DEATHS

The balance of the birth-rate over the death-rate in the United States will be a trifle more favourable this year than in 1936, according to the statistical bulletin of the Metropolitan Life Insurance Company. This is not due, however, to an increase in the birth-rate, which was approximately 16·5 per 1000 population for both years, but rather to a decline in death-rate from 11·7 per 1000 in 1936 to 11·5 in 1937. The true significance of our declining birth-rate can be understood only by a study of the degree to which women of different ages and births of successive orders of children are involved. Computations by the same company's statistical bureau compare the periods from 1920–24 and 1930–34. In the age-group 15–19 the rate of reproduction fell from 4503 per 100,000 to 4168, a drop of 7·4 per cent. In each of the next three age-groups, 20–24, 25–29, and 30–34, the rate of reproduction declined even more sharply, with drops of 18·0, 25·1, and 29·6 per cent. respectively. The age-group table shows a birth-rate progressively declining among older women. It is noted that the gross reproduction-rate for first children declined the least, the figures being 76,695

in the earlier period and 65,090 in 1930–34. For subsequent orders of children up to the fifth the percentage decline assumed a rapidly increasing importance, the figures for the second, third, and fourth orders of birth being 19·2, 25·5, and 30·0 per cent. respectively. The data presented in the two tables are necessarily related. Children of the higher orders of birth are born, on the average, of mothers whose ages lie toward the end of the reproductive period. Thus the declining birth-rate in the United States is due not so much to general reduction in the reproductive rate of women as to the limitation of families, whereby children of higher orders of birth are rendered more scarce, and the birth of American children tends to take place in increasing proportion among relatively younger women.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A HOSPITAL PHYSICIAN

II

OPPOSITION to the development of national or municipal services is not by any means confined to the medical profession. The extended use of hospitals has meant a rapid increase in expenditure, and the bill for new buildings and equipment has been met by pressing into service quite an appreciable proportion of the whole population as collectors by means of flag-days, special appeals, organised lotteries and competitions, and contributory schemes. There have been curious episodes in the campaign, and a few open scandals, which have alienated sentiment, already a little strained by too fervid and constant stimulation. But the system has created a vast body of people, both humble and exalted, who are accustomed to devote a good deal of their energy and leisure to this one purpose—many of whom, indeed, make it one of their main interests in life.

Of the larger donations it has been cruelly said that the rich would be at a loss to know where to bestow their fortunes, regarded with a covetous eye by the Chancellor of the Exchequer, if hospitals ceased to be objects of charity. Charity is the noblest of virtues, and it is perhaps straining its boundaries to include the signing of cheques and bestowing of legacies for sums the loss of which has no effect on the daily lives of the benefactors. A not very healthy sense of proprietorship and patronage is created.

Various categories of supporters combine to form a strong interest vested in the maintenance and protection of voluntary hospitals and their corollary, private specialist practice; but in fairness one must distinguish between those who, perhaps too uncritical, aim solely at an ideal, and those who jealously oppose any attempt to augment the service offered to the sick by providing hospital services through public authority.

Nobody claims, of course, that the voluntary hospitals supply the entire needs of the poor; nor does anyone raise any objection to the public institutions which care for the aged, for the chronic sick, for mental disease and deficiency, and for the acute infectious and other special categories of disease. It is the development of general hospitals for acute illness by government authority that is so much disliked and the projected provision of extended domiciliary medical service. The Poor-law Commission of 1909 even stated in its report that "there was a danger (sic) of the infirmaries being regarded as State hospitals."

The argument advanced is that, in this field, the voluntary hospitals are, by the nature of their organisation, paramount, adequately fulfilling the needs of the poor and giving them, it is even claimed, a service superior to that obtainable by any except the very rich. Dr. McCurrich, by no means uncritical of the voluntary hospital system, yet gives a somewhat extravagant expression to this point of view. "There is no limit," he says, "to the number of hospitals that a patient may visit, and in this way he may consult a large number of eminent specialists about his condition, and note whether they agree or disagree, and thus obtain a very valuable average opinion, a method quite beyond the reach of most paying patients." Another interpretation, one fears, not wholly adulatory, might be placed upon the need for such an excursion.

* * *

In the work of our hospitals there are, in fact, grounds for admiration and also for criticism, and for the most part both blame and praise are due, in respect of the same factors, to almost all hospitals whether charitable or rate-aided. There are, however, certain factors peculiar to each which must be assessed before one can survey the hospital service as a whole and estimate the extent to which it uses the resources which research has made available, furthers research itself, and mitigates the suffering in illness which poverty so abundantly causes.

* * *

The London Hospital in 1933 admitted some 14,000 patients, but over 100,000 were examined as out-patients. The doors of the voluntary hospitals are open to all, and no patient is refused examination; but there is no guarantee of admission to the wards, however grave the need. This fact is merely a reflection of finance, since the maintenance cost of each bed is round about £200 per annum; the out-patient clinics, relatively inexpensive to maintain, can deal with the very large number attracted by the hospital's reputation, but only a portion of patients examined, whose illness demands admission to hospital, can be given beds there.

This disproportion between in-patient and out-patient facilities represents almost daily hardship; the sympathetic help of nurses and almoners, given to those who need admission and are refused it, softens but cannot abolish the delay, risk, and expense of transport to another institution. Deaths occurring shortly after transfer from one hospital to another are not infrequently the subject of comment in the coroners' courts. The fact that voluntary hospitals rarely maintain their own ambulance service is an additional disability.

Dr. McCurrich's patient, touring the voluntary hospitals of London to obtain a "valuable average

opinion" upon the carcinoma of his pylorus, may find them all ready to operate but none able to provide the bed in which he is to recover from the operation. Waiting-lists, which may extend to several months or even years for the less urgent cases, are really inexcusable; they have been known to lead to patients being transferred from the operable to the inoperable category by the mere extension of a disease process, and the relief felt by the person responsible for arranging admissions when he learns that patients have undergone spontaneous recovery in the interval may have its counterpart in weeks of unnecessary suffering.

The scramble for priority of admission leads to a selection of cases of which the hospital's clients are unaware. Other things being equal, the patient with what might be called a short-term illness is given preference, but the medical interest of the moment, and the apparent suitability of the disease for students' instruction, are also factors of importance, and Dr. McCurrich is not the first to call attention to the existence of what is really an indirect premium payment for priority, in the desire of a consultant, who has received a fee as "second opinion" in private practice, to satisfy patient and general practitioner by expediting admission to hospital. Similar pressure is exercised when the patient's interests are supported by individuals or societies who contribute to the hospital's funds.

Dearth of ready money is responsible for many other deficiencies that rob the voluntary hospital of any title to be regarded as a complete unit. The specially qualified hospital almoner is chiefly occupied in securing for patients help from a multiplicity of charitable sources for the expenses of treatment which the hospital advises but is unable to provide. It is even the practice at one large teaching hospital in London to refuse admission to "destitute" cases (i.e., those in receipt of public assistance) and to unmarried mothers, because the expense of their subsequent convalescence and "social care" is considered prohibitive. Sir Arthur Newsholme in his "International Studies" (1931) notes "the essential fact that hospitals have ceased in large measure to be charitable institutions."

* * *

The work of voluntary hospitals differs so much from one institution to another that generalisations are unjustifiable. Connexion with a medical school is not an absolute guarantee of efficiency. Senior staff appointments to fill vacancies are made on the recommendation of the existing staff, who may generally be relied upon to recommend suitable candidates. But nepotism undoubtedly often influences choice; insularity and selfish conservatism may prevent the fullest use being made of the opportunities. An additional staff appointment means another permanent competitor for fees, and the financial heyday of consulting practice has long since passed. This competition is often the basis of the lamentable jealousy so often apparent between members of the honorary staffs of voluntary hospitals, which may lead to a complete absence of coöperation between two sections of a hospital, and is always inimical to research.

The output of valuable research work by clinicians in voluntary hospitals is now in fact not great; capacity for such work, which is not widely distributed, is not considered an important recommendation for appointment, and the obligations of private practice upon a man who has no private means make a voluntary hospital appointment unattractive to those whose primary interest is research.

Finally, I want to mention one other serious defect (as it seems to me) in the organisation of work in the voluntary hospitals. The number of resident medical officers is usually adequate, but the responsibility allotted to men and women who have just passed out of the schools is often dangerously great. There is a tendency to increase the number of more experienced residents, but it remains the usual practice to lay upon newly qualified residents the onus of making the primary decision as to whether or no a new patient is worthy of serious consideration. This practice is unjust to both patient and doctor, and is often responsible for grave mistakes.

THE SERVICES

Health of the Air Force

THE report of the Director of Medical Services for 1936 [1] shows that the expansion of the Royal Air Force and the lowering of the medical standard for recruits has not produced any striking changes in its health. Rejections on medical grounds fell from 46 per cent. in 1935 to 36 per cent. in 1936, and the total strength rose from an average of 32,000 in the period 1928–35 to 48,000, of whom 12,000 were stationed abroad, but though the incidence of sickness increased from 675 to 746 per 1000 this was largely due to chance epidemics of influenza and german measles.

About seven-eighths of the total sickness was due to disease and the other eighth to accident, a proportion that changes very little from year to year. Apart from injuries, infections of the upper air-passages were the commonest causes of disablement, followed by gonorrhœa, skin infections, rubella, acute rheumatism, and appendicitis. The incidence of tuberculosis was 0·8 per 1000, about the same as the previous year, and was very much higher in foreign than in home stations. Venereal diseases steadily decline, the incidence in 1936 being 9·0 per 1000, the lowest recorded. Illnesses of all kinds were commonest in those under 18 years and became progressively less common up to 40. The sickness incidence abroad, 873 per 1000, was rather higher than at home, and the highest figure, 926 per 1000, was in the Far East, though there were comparatively few cases of tropical disease. There were 181 deaths in the service in 1936; of these 118 were due to injury, a lower figure than in 1935 when 52 men died in the Quetta earthquake. Pneumonia, septicæmia, and digestive diseases were the commonest causes of death.

About a fifth of the 2800 accidents were on duty and about a third of these in actual flying. Organised games, especially football, were responsible for over 1000 injuries, and another 1000 were incurred in motor vehicles, various forms of athletics, and ways unconnected with the Service. Four men were wounded in action in the air, two of whom died, and three were attacked, one in Palestine fatally, by unknown assailants on the ground. Although there were few flying accidents, nearly half of them were fatal—88 in 1936, compared with 40 in 1935—and these accounted for three-quarters of the total accidental deaths.

[1] Report on the Health of the Royal Air Force for 1936. H.M. Stationery Office. Pp. 99. 2*s*.

As in previous years the commonest causes of invaliding out were mental diseases, epilepsy, psychoneuroses and other diseases of the nervous system, and tuberculosis, these together accounting for 123 of the total of 264. In addition, 25 recruits were discharged because they were temperamentally unsuitable, many of them having enlisted under the expansion scheme and been unable to adapt themselves to service life.

Parkes Memorial Prize

The Parkes memorial prize for 1937 has been awarded to Major J. Biggam, F.R.C.S., of the Royal Army Medical Corps, for his investigations into the lighting of barracks and other military institutions coupled with his work on the effect on vision of the wearing of the service respirator and for the spectacle frame he has designed to be worn with the respirator.

PANEL AND CONTRACT PRACTICE

Irregular Issue of Prescriptions

Two practitioners who have issued prescriptions to persons not on their lists are to be surcharged 10*s.* 6*d.* and £2 12*s.* 7*d.*—i.e., the cost of the prescriptions. In one case the doctor lives at an hotel and treats the insured resident staff there. It has been his practice to provide treatment for non-resident staff and to issue prescriptions to them, although they are insured persons on the lists of practitioners in the vicinity of their homes. He has made no charge, of course, for the treatment given, but as it was not treatment required by an accident or other sudden emergency, it was improper for him to issue the prescriptions. In the other case the practitioner issued prescriptions to persons whose names had been removed from his list because they were no longer entitled to medical benefit—sometimes as long ago as 1932. He apparently thought that anybody who had been insured and had passed the age of 65 was ipso facto entitled to medical benefit. Actually a person must be insured on reaching pensionable age if title to benefit is to continue throughout life.

The National Formulary

It is sometimes alleged that insurance practitioners are restricted in their prescribing to the preparations contained in the National Formulary, and unfortunately some practitioners have this impression. The fact is that insured persons are entitled to receive all proper and necessary drugs and prescribed appliances, and while the National Formulary contains a list of useful prescriptions there has never been any suggestion that a practitioner is debarred from prescribing whatever he thinks necessary—assuming that he exercises proper professional skill in determining what the patient really needs. A special return has recently been prepared at the request of the Ministry of Health showing the number of times each of the preparations contained in the Formulary occurs in a representative sample of prescriptions. The test covered five metropolitan boroughs and related to the prescriptions issued by 187 practitioners. No account was taken of preparations mentioned in the Formulary as appertaining to the British Pharmacopœia or the British Pharmaceutical Codex or of preparations considered to have been superseded by later formulæ included in the B.P.C. 1934. (It will be remembered that the current edition of the National Formulary was issued in 1933.) It was found that 1851 Formulary preparations—i.e., about 62 per cent.—occurred in the 2975 prescriptions examined.

Expensive Drugs

In principle an insurance doctor has not to consider whether a drug is costly but only whether it is unnecessarily costly. An example of this principle has received some public attention at East Ham where an insured woman suffering from Addison's disease is receiving daily injections of an extract of adrenal cortex at an estimated cost to the insurance fund of some £240 a year. The insurance committee is, we understand, taking the advice of the Ministry of Health in the matter; but the situation is not unique. As long ago as November, 1932, the London committee reported a similar case, and since then there have been others treated with some suprarenal preparation both by injection and by mouth, one of them continuously for more than four years. The crucial question for an insurance committee to decide is whether a preparation equally suitable for the treatment which the practitioner considers desirable could have been ordered at less cost. No particular drug can be prohibited on the ground of cost alone. The general principle was well established in the early days of insulin treatment.

Getting Rid of a Patient

An insured person complained about the treatment provided by his insurance practitioner, but it was clear that the complaint was really made because the doctor refused to certify him as incapable of work. (The fact that another practitioner gave him the certificate he wanted does not affect the situation, for a medical certificate must express the opinion formed by the practitioner making the examination.) The case was a little unusual because the practitioner accused the patient of truculence towards him and the patient accused the practitioner of being offensive. The medical service subcommittee did not have to deal with this aspect of the case, but it is significant that the practitioner, after refusing to issue the certificate of incapacity, demanded the patient's medical card and signed the appropriate part as indicating his consent to an immediate transfer to someone else's list. Such a transfer, however, would only take effect if and when the insured person found another practitioner willing to accept him; and the signing of the form would in no way absolve the original practitioner from his responsibilities. The proper action, since he was no longer issuing certificates of incapacity for the patient, would have been for the practitioner to give notice to the insurance committee of his desire that the patient's name should be removed from his list without arguing with the patient about the card. No reason need have been given, and the removal would have been automatic.

SOCIETY FOR THE PROVISION OF BIRTH CONTROL CLINICS.—A lecture on the theory and practice of contraception will be given to medical practitioners and medical students by Dr. Greta Graff on Friday, Feb. 18th, at 6 P.M., at the Walworth Women's Welfare Centre, 153A, East-street, London, S.E. Practical demonstrations will be given on Friday, Feb. 25th, at 6 P.M. and at 7 P.M. Further information may be had from the secretary of the Clinic.

CORRESPONDENCE

STREPTOCOCCAL MENINGITIS

To the Editor of THE LANCET

SIR,—Mr. Terence Cawthorne's timely paper in your last issue leads me to repeat two suggestions for the study and record of meningitis that I have already made in another journal (*Guy's Hosp. Rep.* 1937, **87**, 477). These suggestions are, first, that we should keep cases secondary to ear disease distinct from those that arise from infection in the nose; and, secondly, that in otitic meningitis the condition of the middle-ear cleft, immediately before its onset, should whenever possible be determined so that we may make a careful distinction between meningitis arising from an acute invasion of the previously unaffected middle-ear cleft and that which complicates chronic otitis media.

I believe that such a distinction will do much to clarify the symptomatology and to put us in the best position to use sulphanilamide in the treatment of these cases that previously have been hopeless. We need to differentiate between those symptoms which are the direct result of meningeal irritation and those which arise from lesions of other structures, such as the dura mater or the cortex of the brain, which are involved at the same time. Mr. Cawthorne, upon whom has fallen the mantle of Mr. G. J. Jenkins, probably sees many cases of meningitis secondary to chronic ear disease in which one or more of the other neighbouring structures are involved. By the nature of my work I see more often cases that come in the other category in which meningitis is secondary to an inflammation of the previously unaffected middle-ear cleft, and in which it is rare for other lesions such as lateral sinus thrombosis or cerebral abscess also to be present.

Brief notes on the symptoms that Mr. Cawthorne describes under the stage of onset may bring out the difference in the two clinical types of otitic meningitis.

Headache.—I do not find this either early or constant. Its absence cannot be explained by the patients being children, for they do not cry. The earliest pain is in the neck on flexion, or in the back when testing for Kernig's sign.

Photophobia and *increase of tendon reflexes* I do not see.

A *rigor* results from a sudden access to the blood stream of a considerable dose of organisms. It is exactly the same as the rigor that supervenes upon a sudden entry of foreign protein in any other way, including the subdivision of the parasite in malaria. It is an indication of invasion of the lateral sinus which may accompany invasion of the meninges. This double invasion is probably commoner in chronic disease than in the type that I see, in which it is rare.

I am interested to read Mr. Cawthorne's note on *increased mental activity*, but I believe that this is characteristic of the hæmolytic streptococcus rather than of its access to the meninges, for I have seen it in cases of septicæmia without meningitis.

I do not believe that either *vomiting* or *convulsions* result from an inflammation of the meninges. I suspect that each is the result of a vascular disturbance of the cortex of the brain from retrograde embolism along or thrombosis of the cerebral veins that cross the meningeal cavity to the sinuses of the dura mater. Neither occurs in the pure meningitis secondary to an acute infection of the previously unaffected middle-ear cleft.

This leaves us with *neck* rigidity, which in such cases is the first and should be the only symptom. Removal of the factory of organisms in contact with the dura mater should be the routine without delay. Sulphanilamide may be given as an accessory; but had better be deferred until the diagnosis of streptococcal infection is confirmed by cultivation from the bone removed at operation. In this type of otitic meningitis diagnosis cannot be made by lumbar puncture. When anything positive can be obtained thereby the time to save the patient's life has passed.

Whether late cases will be saved in the future by means of this drug time alone will show. It is possible that they may be; but we must be careful not to allow patients to progress to this stage because we believe that we have a drug that may save their lives after we have endangered them by delay. Mr. Cawthorne has noted reports of 40 recoveries in eighteen months, but I do not think these reports make the distinction between the two clinical types of otitic meningitis that it is the purpose of this letter to emphasise: and I have yet to see one saved by sulphanilamide in the class of cases secondary to an acute invasion of the previously unaffected middle-ear cleft once it has passed on to the stage of the established disease.

I am, Sir, yours faithfully,

Guy's Hospital, S.E., Feb. 6th. T. B. LAYTON.

URTICARIA DURING BLOOD TRANSFUSION

To the Editor of THE LANCET

SIR,—I read with interest in your last issue the account of urticaria during blood transfusion by Dr. Stewart and Mr. Bates. Last year I observed a similar reaction, and at that time I was unable to find anyone who had had a like experience.

My patient was a woman aged 52, who was suffering from aplastic anæmia. She belonged to group A (Moss 2) and I used donors of the same group for every transfusion. She gave no personal or family history of allergy.

The transfusion concerned was the sixteenth; her first transfusion had taken place fourteen weeks before and the donor was giving blood for the first time. Direct matching of donor's blood and patient's serum showed compatibility and 450 c.cm. of blood was drawn into 50 c.cm. of citrate solution. The blood was injected at a rate of 10 c.cm. per minute. After 300 c.cm. of blood had been infused the patient said she felt hot; two minutes later I noticed that she was flushed and, as I watched, urticarial weals came out on her face, chest, and arms, being most marked on the arm into which I was giving the blood. I immediately stopped the transfusion and injected 5 minims of adrenaline subcutaneously. Her pulse-rate had risen from 90 to 120 and she still felt very hot. Twenty minutes later the weals had gone, but the flush persisted for about an hour. Ninety minutes later she felt her usual self. No rigor occurred. The donor had eaten a light fish lunch, and admitted to perfect health.

I kept some of the blood and citrate solution and next day injected intradermally a few drops of each, using saline as a control. No reaction whatever took place.

A week later I gave the patient another transfusion of 450 c.cm. About ten minutes after the infusion was over she again became very flushed and complained of breathlessness. On auscultation, the characteristic prolonged expiratory rhonchi of bronchial asthma were heard. I again injected 5 minims of adrenaline and she felt normal in an hour. There was nothing relevant in the donor's story.

My patient received five further transfusions without untoward result. She died of pneumonia six weeks later.

So rare a complication occurring twice in one week in the same patient indicates temporary sensitisation to one of the constituents of foreign blood. As the second donor had not eaten fish, I feel we cannot incriminate the lunch eaten by his predecessor. The negative dermal reactions between the transfusions add further confusion.

Allergic phenomena are so elusive that I am disinclined to draw conclusions from a single case. I remember a woman who, after a transfusion for post-partum hæmorrhage, was seized by a violent paroxysm of sneezing. In this case, too, we must take comfort from the mystic word allergy.

I am, Sir, yours faithfully,

Elms-road, S.W., Feb. 6th. GAVIN THURSTON.

FOMITES IN TUBERCULOSIS

To the Editor of THE LANCET

SIR,—Now that the Government's Fitness Campaign is coming to an exciting end with special emphasis on the Tuberculosis "Service," may I as one who has had opportunities of noting the varying degrees of enthusiasm or indifference with which the battle against the "white scourge" is conducted in rural areas make one elementary suggestion? It is that some uniform and efficient method of disinfecting the bed, bedding, and room of the consumptive when he dies or is otherwise removed from his cottage should be adopted.

As far as my observation goes generally nothing is done at all. Sometimes the sanitary authority will come round rather belatedly and advise ordinary household cleaning; once or twice I have known them even burn a formalin lamp; but no energetic steps are taken to see, for example, that the blanket that has been encircling the dying consumptive's neck is not used to wrap up the new baby.

The trouble of course is the long incubation time of the tubercle bacillus. When at last this neglect becomes apparent the medical officer of health, the tuberculosis officer, and the sanitary officer are either comfortably retired or deservedly dead. Yet if there is one thing about which everyone seems to be agreed it is that massive infection should be avoided.

I am, Sir, yours faithfully,

Beckley, Sussex, Feb. 7th. C. G. LEAROYD.

ERYTHROCYTE SEDIMENTATION AND THE PLASMA FIBRINOGEN

To the Editor of THE LANCET

SIR,—Some years ago it occurred to me to wonder whether the plasma factors responsible for the increased erythrocyte sedimentation-rate (S.R.) in malignant disease, in some juvenile diabetes mellitus, and in some forms of arterial disease were always the same. The technique employed was similar to that described by Dr. Oakley in to-day's issue of THE LANCET. Rapidly sedimenting bloods from the different conditions were mixed together and the S.R. of the mixture was compared with that of the component bloods, the theory being that if a different excess or deficiency was responsible in the two diseases, mixing the bloods would compensate and the S.R. of the mixture would be considerably less than that of the component bloods taken separately. Unfortunately mixing bloods of different blood groups affects the S.R. and after spending some thousands of hours rediscovering a number of well-known facts, I found myself being dragged into the quicksands of little understood mathematical physico-chemistry and so abandoned a laborious research for which the time is not yet ripe.

One point, however, has a direct bearing on Dr. Oakley's paper. Any blood with a normal low S.R. mixed with a rapidly sedimenting blood affects a very considerable reduction in the rate. The reduction of the two-hour rate from 107 mm. to 44 mm., which occurred when 50 per cent. of blood without fibrinogen was admixed, could equally well have been produced by the addition of 50 per cent. of normal blood of the same group. Very careful control experiments would need to be done to justify the conclusion that the diminution in S.R. was due to lack of fibrinogen in the blood which was added.

It would be of interest if Dr. Oakley could keep in touch with Dr. Macfarlane's patient and report on what happens to the S.R. in acute infections. Such observations would, I believe, be unique.

I am, Sir, yours faithfully,

Oxford, Feb. 5th. DENYS JENNINGS.

MEDICAL DEGREES AT HONG-KONG

To the Editor of THE LANCET

SIR,—My attention has been drawn to an article on Medical Careers in the Tropics by Prof. R. T. Leiper, which you published on Oct. 16th last, and I would like through your columns to make a slight correction to the reference to medical education in Hong-Kong.

In the article it is stated that Hong-Kong, amongst other places, grants a diploma and that this diploma has recently been recognised by the General Medical Council of Great Britain. The true facts are that the Hong-Kong College of Medicine—founded exactly fifty years ago by Manson and his fellow-workers—did grant a diploma. In 1912 the University of Hong-Kong was opened and the College of Medicine ceased to exist as such and automatically became the medical faculty of the University. The last diplomas were granted in January, 1915, and since that date the only registrable qualification obtainable in Hong-Kong has been the M.B., B.S. of the university.

The recognition of this degree by the General Medical Council of Great Britain can hardly be called recent, for the medical faculty minutes of a meeting held in September, 1913, record the receipt of a letter from the registrar of the General Medical Council to the effect: "that the Council had decided to recognise the degrees in Medicine and Surgery of the University granted after examination, for registration in the Medical Register." This recognition has been continuous throughout the intervening period.

I am, Sir, yours faithfully,

L. T. RIDE,
Dean, Faculty of Medicine, University of Hong-Kong.

Jan. 21st.

CONTROL OF A TYPHOID EPIDEMIC

To the Editor of THE LANCET

SIR,—In your last issue you published a letter from Major R. F. E. Austin. In his capacity as vice-president of the National Anti-Vaccination League, his antipathy to all forms of prophylactic inoculation or vaccination is comprehensible, but as one who has belief in this form of treatment I fail to understand his arithmetic. The two cases of enteric landed from s.s. *Habana* had contracted the disease in Spain while the three subsequent cases diagnosed on May 30th, June 1st, and June 4th were probable

contacts, and we naturally expected many more contacts to follow this second batch. The average incubation period for enteric is 14 days, but it may be much longer, with some latent cases (Greenwood and others, *Lancet*, 1937, **2**, 1399) occurring weeks later. In Price's "Text-book of Medicine" (London, 1937) the following statement is made: "It is believed that an individual inoculated at the beginning or even in the middle of the incubation period of typhoid has a good chance of escaping the fever." Vaccination carried out in the first week after exposure to small-pox will prevent the disease.

I thoroughly appreciate the value of sanitation and hygiene, and our sanitary experts at the camp did admirable work in difficult surroundings, but it must be agreed that the sanitation of an emergency camp is far different from that of a modern town. Yet in two recent epidemics contact cases persisted for months, while our epidemic ceased after general inoculation.

I am, Sir, yours faithfully,

London, E.C., Feb. 5th. RICHARD TAYLOR.

RELATIVE IMPORTANCE OF INFECTIOUS DISEASES

To the Editor of THE LANCET

SIR,—In your report (p. 323) of a discussion on the enteric group diseases you quote me as saying that diphtheria and scarlet fever are far more important causes of death than enteric. What I actually said was: "The public should know that, *pace* the newspapers, enterica is not now such an important health problem as diphtheria or measles."

I am, Sir, yours faithfully,

ANDREW TOPPING.

London County Council, Public Health Department, Feb. 4th.

CONTRACEPTION AND FERTILITY

To the Editor of THE LANCET

SIR,—In your issue of Jan. 22nd Mr. Green-Armytage is reported as saying at a meeting of the West London Medico-Chirurgical Society on Jan. 7th that he "was convinced that contraceptive measures in the early days of marriage were inimical to pregnancy later." I have been instructed by the medical subcommittee of the National Birth Control Association to draw the attention of your readers to the fact that there appears to be no medical evidence whatever to corroborate this statement. Records which have been carefully kept at clinics go to show that in many thousands of instances fertility has been in no way impaired by the use of contraceptive measures in early married life.

I am, Sir, yours faithfully,

M. A. PYKE,
Secretary, National Birth Control Association.

26, Eccleston-street, London, S.W.1, Feb. 2nd.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 29TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2431; diphtheria, 1892; enteric fever, 61 (26 "expected"); pneumonia (primary or influenzal), 1302; puerperal pyrexia, 191; cerebro-spinal fever, 28; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 3; dysentery, 273; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 4th was 4388, which included: Scarlet fever, 817; diphtheria, 1409 (carriers 34); measles, 747; whooping-cough, 311; puerperal fever, 23 mothers (plus 10 babies); encephalitis lethargica, 282; poliomyelitis, 0. At St. Margaret's Hospital there were 16 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 37 (2) from measles, 10 (0) from scarlet fever, 16 (2) from whooping-cough, 40 (7) from diphtheria, 60 (25) from diarrhœa and enteritis under two years, and 60 (9) from influenza. The figures in parentheses are those for London itself.

Croydon reported the 2 deaths from typhoid. Liverpool had 10 deaths from measles, Manchester 5. Birmingham reported 4 deaths from whooping-cough, Liverpool 3. Diphtheria was fatal in 23 great towns, Manchester reporting 5, Liverpool 4.

The number of stillbirths notified during the week was 286 (corresponding to a rate of 43 per 1000 total births), including 49 in London.

THE LANCET 100 YEARS AGO

February 10th, 1838, p. 701.

From a paper "On Benevolent Funds and Life Assurance in Health and Sickness," read before the Council of the British Medical Association [an ephemeral rival of the present Association] by WILLIAM FARR. *Farr, the founder of the science of vital statistics, became compiler of abstracts in the registrar-general's office in 1838 and held this post for 41 years.*

Medical men, like people of other professions, sink, in addition to the sums spent in their early education, capital in acquiring a knowledge of the sciences, and professional skill, which can be rarely turned to account, so as to yield a fixed income, before the age of thirty; and, after that period, some time elapses before they realise a fixed income surpassing the expenditure their families and their position and success in society demand. Such is the general course of things. Arrived at this point, several cases may be supposed. A certain number realise an ample income. The majority succeed in establishing themselves so as to bear up under ordinary circumstances; to live from year to year, but to have no surplus. Some travel over the best part of life in this uncertain struggle; and sickness, accident, untimely death, plunge the individual, or those dependent upon his exertions, into destitution. This is often the man's own fault; he or his family have been vicious, improvident, extravagant, or unmindful. But this is not always true: looking around us at the numbers of competitors and at the inequalities that spring up in practice, we may fairly exclaim with the fisherman who had just escaped drowning: "Master, I marvel how the fishes live in the sea,"—and admit the accuracy of the allusion, "Why, as men do a-land; the great ones eat up the little ones." Such inequalities arise very naturally, and are inevitable. . . . It is to alleviate the pressure of accidents, and the bitterness of privation arising in these circumstances, that the Benevolent Fund is set apart. . . .

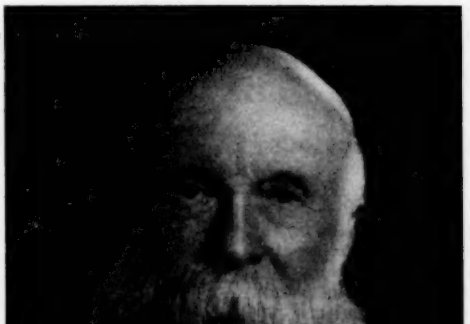
We come now to the question what should medical men do in providing against the contingencies of life. First. Every man, having a wife, children, or aged parents dependant on his exertions, should unquestionably insure his life, so soon as he can set aside a sum, however insignificant, from his income. . . . Those who cannot provide for the present of course cannot assure against futurity; they must redouble their exertions, trust in Providence, and hope in the benevolence of our fund. Few in a profession like ours require to be assured against ordinary attacks of sickness; but in extreme cases of protracted disease, or chronic disability, this kind of assurance may prevent many from falling into misery or dependence. . . .

OBITUARY

SIR JAMES CRICHTON-BROWNE, M.D., LL.D., F.R.S.

Sir James Crichton-Browne died at his home in Dumfries on Jan. 31st, at the age of 97. His vitality and perpetual youth, which were the admiration and envy of his colleagues, proved inadequate to withstand the shock of the death of his son last October.

James Crichton Browne was born at Edinburgh in 1840, the son of Dr. W. A. F. Browne, a commissioner in lunacy for Scotland, and was educated at Dumfries Academy, at Trinity College, Glenalmond, at Edinburgh University, where he was a pupil of Lister, and at the University of Paris. He qualified L.R.C.S.Edin. in 1861 and M.D. in the following year, and became medical officer successively at Derby, Devon, and Warwick county asylums, and medical superintendent at Newcastle borough asylum. In 1866 he took charge of the West Riding asylum at Wakefield, where his clinical and pathological investigations in neurology paved the way for the later researches of Ferrier, Hughlings Jackson, and Horsley. Here he founded and edited the "West Riding Asylum Reports," the first British journal of neuropathology. In 1875 he left Wakefield on being appointed Lord Chancellor's visitor in lunacy, a post he held until 1922. For nearly fifty years his advice was thus available to the Court of Chancery through the Master in Lunacy about the comfort and supervision of the wards and the proper allocation of their estates.



[Photograph by Elliott & Fry

He was one of the first and most inspiring advocates of the early treatment of threatened mental breakdown as an essential first-aid in mental illness, which the Mental Treatment Act of 1930 has brought within the reach of both rich and poor. He urged the necessity of the study of childhood as affording the best key to the interpretation of early mental symptoms, and his thesis published in 1883 in Malcolm Morris's "Book of Health" is still the standard authority on the relation between education and the nervous system. In the following years he successfully aroused public opinion against overpressure in elementary schools and the principle of payment by results. In 1886, when he was knighted, THE LANCET said "he has well won his spurs as a scientist, and will wear them not only worthily but with the esteem of his profession." In 1883 at the proposal of Charles Darwin he had been elected a fellow of the Royal Society, and in 1889 he became treasurer of the Royal Institution, at the meetings of which he was for long a prominent figure. He was given honorary degrees by the universities of St. Andrews, Aberdeen, Leeds, and Edinburgh, and was president at various times of the Medical Society of London, the Neurological Society, the Medico-Psychological Association, the National Health Society, and the Sanitary Inspectors' Association. He was one of the founders of *Brain* and edited the journal for a time with Hughlings Jackson and David Ferrier.

His official duties, which necessitated much travelling about the country, would have monopolised the energies of most men, but did not prevent him from interesting himself in other subjects—he took part in a controversy with Froude about the relations of Carlyle and his wife. But his main fields were those of mental and nervous disease and public health. He held strong views against teetotalism and maintained that no writer had done much without alcohol. He disagreed with the Psalmist's three score years and ten; by using common sense and avoiding fads everyone, he said, should live to a hundred. With advancing age his energies were amazingly retained, and since 1930 he had published five volumes of reminiscences, of which his "More Leaves from a Doctor's Diary" appeared last October, besides speaking of his experiences and propounding his philosophy on the wireless. His Dundreary whiskers, the last of their kind, his courtly manners and rounded phrases brought us a glimpse of the Victorian era at its best.

Sir Robert Armstrong-Jones, who was his colleague for the last ten years of his official life as Lord Chancellor's visitor, says of him: "He was a man of wide reading, accurate thought, and clear expression, as well as of marked literary culture and ability. In a controversy his weapon was the invincible spear of sound reason, which characterised all his arguments. He was an especially gifted orator, and indeed one of the best after-dinner speakers in our day. He was eloquent, clear, decisive, and well-informed. He possessed a mind of no ordinary intellectual powers, strengthened by an excellent memory. He never spoke except with the dignified and graceful authority of a supreme master of his subject, and he was listened to with riveted attention, admiration, and respect, more especially when pleading the cause of the mentally ill and the men and women who succour them. The amount of time, labour, and scrupulous attention he devoted to the care and treatment of the most afflicted of suffering humanity was immense. Nor did he overlook the material comforts of those under his care. His patients reposed implicit trust in his courteous vigilance as a guardian of their welfare, and after his retirement would often recall his deeply felt understanding and sympathy, and his generous and real friendship."

Sir James's first wife was the daughter of Dr. Halliday, and died in 1903 leaving him with a son and a daughter. In 1912 he married Audrey Emily, daughter of Sir E. Bulwer and niece of Bulwer Lytton. His son, Colonel Harold W. A. F. Browne the explorer, died in October, 1937, at the age of 71.

ALBERT EDWARD HODDER, D.S.O., M.B. Camb.

Dr. Hodder, who died on Feb. 3rd at his home in Stafford, had played a large part in public life there, on governing bodies of schools and on insurance committees. Born in Dulwich and educated at Bedford School and King's College, Cambridge, where he was Vintner exhibitioner, Dr. Hodder qualified from St. Mary's Hospital, Paddington, in 1901, and after a house appointment there practised for several years in Wigan before settling in Stafford, where he joined the staff of the General Infirmary first as anæsthetist and later as physician. Within a year or two he was elected to the Staffordshire panel committee, becoming its chairman in succession to the late Dr. Ridley Bailey, and representing the Ministry on the insurance committee. Having at school joined the cadet corps and the territorials in Lancashire, he transferred to the North Midland division of the R.A.M.C. and went to France in 1915 with the 3rd Field Ambulance; two years later he was given command of this unit with the rank of lieut.-colonel and was awarded the D.S.O. On his return after the war he became a governor (and later chairman) of King Edward VI Grammar School and of the Girls' High School, and served for a time on the health committee of the town council. He played an active part in the development of orthopædics at the cripples' centre and in the local nursing association. He was also president at one time or another of the North Staffordshire and the Mid-Staffordshire medical societies. "By culture, temperament, and experience," writes a colleague, "Hodder made an ideal chairman. He held the balance of debate with equal poise and had the gift of seeing the other man's point of view. But amidst his various interests one stood out above all others—his efficiency in his daily job. He had a high sense of the dignity of general practice, and while he made full use of the modern methods of diagnosis he regarded the clinical acumen of the family doctor as the final arbiter."

Dr. Hodder married in 1910 Ethel Mary, elder daughter of Prof. A. C. Haddon, F.R.S., and leaves her with a son and three daughters. He was in his sixty-third year.

THOMAS DONNELLY, M.D. Dubl., F.R.C.S.I., D.P.H.

Dr. Donnelly died last week after some years' retirement from practice. He had spent his life in or near Dublin, from boyhood at Belvedere College and undergraduate days at Trinity College. He took an honours degree (senior moderatorship) in experimental science in 1878, and the medical degrees in 1881, and in 1886 he was admitted a fellow of the Royal College of Surgeons in Ireland. For some time he was assistant physician and pathologist to the House of Industry Hospitals, but on receiving an appointment in the poor-law medical service he devoted himself to general practice on the north side of Dublin. He interested himself greatly in the amelioration of conditions of work in the poor-law medical service, and for a long time was hon. secretary of the Irish Medical Association and editor of its journal. Several years ago he retired from professional work and went to live on a farm he owned some five or six miles from the city. Although he retained a gradually diminishing circle of old friends, he was but little known to the younger members of the profession. He was a man of culture, kindly and courteous in his relations with others, and a capable physician.

ERNEST HAROLD DRINKWATER, L.S.A.

Dr. Drinkwater, who died on Jan. 20th in London after a short illness, qualified at Liverpool in 1903 and then came to London for post-graduate study. "He was," writes F. R. S., "a man of many parts. Beginning early in general practice in a populous district in South London, he gained a wide experience of medicine and surgery, and developed a keen insight into the psychological side of his profession. Later he devoted himself for a time entirely to anæsthetics, holding posts at the Prince of Wales Hospital, Tottenham, and the Royal Dental Hospital. Finding this too restricted for his activities he again took up general practice as a consultant, developing especially the side of electrotherapeutics which had always interested him. The meticulous care and thoroughness with which he investigated every case, coupled with an intuitive perception, sometimes led to success where others had failed. He remained a keen student to the end of his career, and was always abreast of the latest researches in medical science. Latterly his health had suffered through untiring devotion to work."

Dr. PERCY COLEMAN, who died at Clacton-on-Sea on Feb. 4th, was one of the founders of the local hospital and for many years chairman of its board of management. Qualifying from St. Thomas's Hospital in 1890, Dr. Coleman took his medical degree at Durham two years later, and before settling in Clacton he had held many house appointments. One of these was house physician at the Middlesex Hospital and he became medical officer to their seaside convalescent home. He was also on the staff of the many other convalescent homes in the neighbourhood.

INSTITUTE OF RAY THERAPY: NEW EXTENSIONS.—On Feb. 5th the Princess Royal visited this institute, in Camden-road, N.W., to open its new extensions. The ceremony was held in the new building on the ground floor which has yet to be equipped. On the first floor the new electrotherapy department with its equipment for short-wave diathermy and inductothermy has already been established. There are also sections for physical and remedial exercises and for medical electrical treatment. In the old building, which has been thoroughly renovated, X ray treatment and other forms of irradiation will be given. The extension has cost £7500 and £1500 more is required to complete the equipment. The institute is open from 2 P.M. to 9 P.M. daily for the treatment of people of small means and there are over 3000 attendances each week.

PARLIAMENTARY INTELLIGENCE

VITAL STATISTICS

ON Feb. 1st the committee stage of the Population (Statistics) Bill was completed in the House of Commons. Sir KINGSLEY WOOD, Minister of Health, said the principal effect of the amendments he was proposing would be the substitution in the schedule of a limited number of defined but simple particulars for the census procedure to which objection had been taken; the particulars to be provided by the person whose duty it was to give the information under the Registration Acts. Such a person was required to give only facts within his knowledge (as from July 1st next), the information being secret and privileged. These particulars would generally supply information about the degree of fertility of the mother, about childless wives, and the information requisite for statistical utilisation of such information. Simple and limited as they were, they would enable an advance to be made in the study of fertility. It would be possible to get, for instance, particulars of the whole issue of the mother. At present the birth-rate information in this country was based on a mass of unrelated units, consisting on each occasion of parents and one child. As a result of this Bill certain supplementary lines of investigation could be made. For instance, the particulars furnished as to the mother's issue, distinguishing living and dead or stillborn children, would help to elucidate the relation between high infantile mortality and a high birth-rate. Cancer had long been studied in relation to marriage in women; it would now be possible to investigate it from the aspect of childless wives and those who had produced children. Recently a letter had appeared in the *Times* from a number of eminent people asking that further particulars should be provided than the mere statement of occupation in general terms; they wanted, on what he might call general census lines, the classification of over 600 heads. For such detailed requirements he thought it would be better to use the powers given under Section 44 of the Births and Registration Act, 1874, which permitted the heading in the registers to be altered and various processes to be adopted whereby more detailed information could be obtained. There was an amendment limiting the operation of the Act at ten years. He did not regard this as unreasonable. Before the end of that period they might have sufficient information upon which to consider the whole matter in its larger aspects.

Mr. PETHICK-LAWRENCE remarked that the proposed alterations would leave about a third of the original measure. But what remained would still attain the object which statisticians had at heart.

Sir FRANCIS FREMANTLE said that since the second reading he had been in touch with statisticians, economists, and sanitarians, and he still believed there were certain points in the original Bill that would have been useful to a statistical inquiry, though they were not essential. The restriction upon the powers of those who were to carry out this investigation would not, he hoped, be found to be too great. The object of this inquiry was nothing less than the answer to the question whether the nation would survive. It would take a considerable time, and they might be losing precious years while other countries had already taken successful steps to stop depopulation.

Sir KINGSLEY WOOD thought that public opinion would grow steadily in favour of the course that had been taken. The amendments were then agreed to and a further amendment that the Act should continue in force until June 30th, 1948. It was agreed that the information required on the registration of a birth or stillbirth should comprise:

(*a*) The age of the mother;
(*b*) The date of the marriage;
(*c*) The number of children of the mother by her present husband and how many of them are living;
(*d*) The number of children of the mother by any former husband and how many of them are living;

and that information on the registration of death should be given as follows:

(*a*) If the deceased was a male, whether he had been married, and, if so, whether he was married at the date of death;
(*b*) If the deceased was a woman and had been married: (i) the year in which she was married and the duration of the marriage, (ii) whether she had children by her husband or any former husband;
(*c*) The age of the surviving spouse, if any, of the deceased.

NOTES ON CURRENT TOPICS

Botulism on British Steamer

Mr. BARNES asked the President of the Board of Trade the cause of the fatalities to the crew of s.s. *Sea Rambler*; whether he was in a position to state if Board of Trade regulations were in any way infringed during this voyage; and whether a Board of Trade inquiry was to be held.—Mr. OLIVER STANLEY replied: Certain members of the crew of s.s. *Sea Rambler* were taken ill while the vessel was at sea during August. On putting into Funchal, Madeira, for medical assistance the disease was diagnosed by the local port medical authorities as food poisoning in two sailors and botulism in five, and an entry in the log was made to that effect. Two of the men died on board, and five men died in hospital at Funchal. Upon arrival at North Shields the usual statutory inquiry was held by the superintendent of the Mercantile Marine Office on Sept. 14th and 15th. The superintendent endorsed the entry in the log. Since the inquiry was held, examination of blood samples from surviving members of the crew has shown that they had suffered from yellow fever. I have no reason to think that Board of Trade regulations were infringed during the voyage. I should like to take the opportunity of expressing my deep sympathy with the relatives of the men who died.

Blind Persons Bill

In the House of Commons on Feb. 1st, when the Blind Persons Bill was considered in committee, Sir K. WOOD moved an amendment to Clause 2 that was designed to bring about greater uniformity in the treatment by local authorities of blind persons in matters not affected by local conditions. This was agreed to. An amendment moved by Mr. WINDSOR and also accepted empowered a local authority to pay or contribute to funeral expenses in the household of a blind person who was dependent on it, the payment of contributions being made under the Blind Persons Act instead of under the poor law.

Mr. JAGGER moved an amendment to Clause 5 providing that in any dispute the decision as to whether a person was blind or not should be left to two ophthalmologists, and a third if these disagreed. Sir K. WOOD pointed out that the conditions had been met by a circular in 1933 which set out the optical criteria defining incapacitating blindness. It would not be practicable everywhere to establish a referee service, since in some areas it would often be difficult or impossible to find the requisite number of specially qualified medical practitioners. The amendment was therefore withdrawn.

Prevention of Road Accidents

In the House of Lords on Feb. 1st it was agreed that the Select Committee on the Prevention of Road Accidents should be appointed as follows: The Marquess of Reading, the Earl of Iddesleigh, the Earl of Birkenhead, Lord Brocket, Lord Alness, Lord Rushcliffe, and Lord Addison.

QUESTION TIME

THURSDAY, FEB. 3RD

Miners' Nystagmus

Mr. JAMES GRIFFITHS asked the Home Secretary if he had received the report of the Committee on Miners' Nystagmus and Lump-sum Settlements; and whether it was proposed to introduce legislation dealing with these matters.—Sir SAMUEL HOARE replied: Yes, Sir, I have received the report. It has been presented to Parliament and will be issued very shortly. I cannot make any statement at present about legislation.

Alcohol and Motor Accidents

Captain ARTHUR EVANS asked the Home Secretary whether his attention had been called to the light sentences passed on motorists convicted of drunkenness when driving and of causing the death of other road users; and whether, taking the whole of the road fatalities of 1937 he could state the number of prosecutions instituted in connexion with them.—Sir SAMUEL HOARE replied: There is no possibility of relating figures of offences by motorists with figures of fatalities. There are, for example, many prosecutions for driving when under the influence of drink where no fatality has occurred; and on the other hand there are many fatalities where no prosecution follows either because there are no grounds for a criminal charge or because the driver suspected of an offence has been killed. The returns of offences relating to motor vehicles during 1937 are not yet complete, but a preliminary examination shows that during the year there were 15 convictions of manslaughter arising out of fatal accidents and that in 13 of these cases the defendant was sentenced to penal servitude or imprisonment.

Anti-Gas Training

Mr. GLEDHILL asked the Home Secretary if any instructions or suggestions had been issued to local authorities regarding the size and type of building used for anti-gas schools and decontamination centres.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Guidance as to the requirements at places where local anti-gas training is undertaken has been given in circulars and is embodied in Section 5 of the Air Raid Precautions Memorandum No. 5—Anti-gas Training. As regards first-aid posts at which facilities for the decontamination of the public would be provided, revised advice was issued to local authorities in a circular on Dec. 10th, 1937, and the further details then promised will be issued shortly.

In reply to a question by Dr. HADEN GUEST and other hon. Members Mr. LLOYD stated that the Home Office would shortly issue to local authorities a supply of the book that had been prepared which could then be circulated to the Air Raid Wardens. In the light of the experience thus gained it would be possible to decide in what form printed advice to each householder could most effectively be given and how and when it should be distributed.

Nursery Schools

Major WHITELEY asked the Parliamentary Secretary to the Board of Education how many nursery schools and classes had been, or were being, established in England and Wales since the issue of Circular 1444 in 1936; how many children were affected; and what was the usual cost to the parent.—Mr. KENNETH LINDSAY replied: Since the issue of Circular 1444, the Board have recognised 19 nursery schools in England and Wales, with accommodation for 1193 children: 32 further proposals providing for 2340 children have been approved in principle: 12 other proposals are under consideration. Under the Board's Regulations no charge can be made to parents of children attending nursery schools except for food and medical treatment. Very little is charged for medical treatment, and the charge for food varies from 1*s.* to 2*s.* 6*d.* a week, with an average of about 1*s.* 3*d.* A reduction or remission of the charge is made in necessitous cases. During the same period provision involving capital expenditure has been approved for 220 nursery classes in public elementary schools, accommodating about 9000 children. The Board's records, however, are not complete, since local education authorities are not required to notify the Board of the establishment of such classes. As in the case of nursery schools no charge may be made to the parents except for food and medical treatment.

Typhoid Fever in Somerset

Sir FRANCIS FREMANTLE asked the Minister of Health if he would give the number of cases and deaths hitherto notified in the present outbreak of typhoid fever in the county of Somerset; and whether the cause had yet been traced.—Sir KINGSLEY WOOD replied: Twenty-four cases, three of them fatal, of the disease have been confirmed. The source of infection has not yet been established and investigations, in which a medical officer of my Department is assisting, are proceeding.

Treatment of Epilepsy

Sir ARNOLD WILSON asked the Minister of Health whether any organised special research into the causes and treatment of epilepsy was proceeding under the auspices of his department in conjunction with the Medical Research Council; whether the British Government was officially represented on the council of the International League Against Epilepsy; and what subvention, if any, it gave towards its activities.—Sir KINGSLEY WOOD replied: I understand that the Medical Research Council are carrying out certain investigations which have a bearing upon epilepsy and related conditions. With regard to the two last parts of the question H.M. Government is not officially represented on the council of the International League Against Epilepsy, nor does it make a contribution in aid of the Council's work.

Prisoners Certified Insane

Mr. JOEL asked the Home Secretary how many persons undergoing imprisonment at Maidstone, Parkhurst, and Dartmoor gaols had during the past five years, been transferred to Broadmoor or other asylums at the termination of their sentences; and how many had been so transferred before the completion of their sentences.—Sir SAMUEL HOARE replied: Persons sentenced to penal servitude who appear to be of weak or unstable mentality are assigned to Parkhurst prison, and during the five years ended 31st December last, 23 of the men sent to this prison were certified as insane and removed to Broadmoor Asylum; two others were certified as mentally defective and sent to Rampton State Institution. There was also removed to Broadmoor Asylum one man who had been sent to Dartmoor prison. All these men were transferred during the currency of their sentences. There were no other cases of men removed from the prisons named to any asylum.

MONDAY, FEB. 7TH

Pasteurisation of Milk

Captain ARTHUR EVANS asked the Minister of Agriculture if his attention had been drawn to the investigations carried out by the Hannah Institute of Dairy Research into the feeding of calves on raw and pasteurised milk by experiments with two groups of calves, the first group with ordinary commercial milk in its raw state, the second group with the same milk after it had been submitted to ordinary commercial pasteurisation in a local dairy; that the results showed that of the 36 calves fed on ordinary commercial milk in its raw state 23 were ultimately found to be infected by tuberculosis mainly in the lungs, and of the 37 calves fed on the same milk after it had been submitted to ordinary commercial pasteurisation in a local dairy no case of tubercular infection was found; and, in view of this, whether he would take steps to make compulsory pasteurisation of all milk marketed.—Mr. MORRISON replied: The answer to the first part of the question is in the affirmative. As regards the second part of the question the Government's proposals regarding the compulsory pasteurisation of milk are outlined in the white paper on Milk Policy issued in July last, and as already announced, it is the Government's intention to bring forward legislation this session on these lines.

TUESDAY, FEB. 8TH

Assault on Patient in Scottish Asylum

Mr. MCGOVERN asked the Secretary of State for Scotland if he could make any statement on the case which came

before Sheriff More, at Banff on Jan. 25th, when Georgina Isabella Logan was charged with beating a dumb woman patient at Ladybridge Asylum, Banff, with a shoe, when in defence she stated that she had seen other nurses do the same thing; what steps were being taken to safeguard these patients against treatment of this kind in future; and if inquiry would be held into the alleged brutalities in this institution.

Mr. ELLIOT replied: Georgina Isabella Logan, aged 18, joined the Banff District Asylum staff as a nurse probationer on Jan. 2nd, 1938. The assault on the patient was committed on Jan. 10th. The matter was reported to the Medical Superintendent next day, and he immediately suspended Nurse Logan and reported the matter to the Procurator-Fiscal. On Jan. 25th Nurse Logan pleaded guilty and the Sheriff deferred sentence till May 11th. Nurse Logan has since been dismissed from the asylum service. The asylum authorities have inquired into Nurse Logan's statement that she had seen other nurses do the same thing. The inquiries were made at the asylum by the county clerk and his deputy, and they reported that they were satisfied that there was no ground for the allegations. Any asylum nurse striking a patient is liable to instant suspension followed by dismissal, and all such offences are reported to the Procurator-Fiscal in order that criminal proceedings may be considered. The General Board of Control have considered this case and are satisfied that it is an isolated one, but I have asked the Board to furnish me with a fuller report on the whole matter.

Food and Drugs Consolidation Bill

Mr. HALL CAINE asked the Minister of Health what steps he proposed to take to negotiate with the various interests concerned as to the terms of the draft Food and Drugs Consolidation Bill; and whether he would give an undertaking that all the interested bodies would be consulted before the Bill was presented to Parliament.—Mr. BERNAYS replied: The draft Bill has been published and placed on sale, and my right hon. friend will be prepared to consider representations from any interested bodies before the Bill is presented to Parliament.

PUBLIC HEALTH

Local Outbreaks of Typhoid

THE sharp rise in the number of cases of enteric fever in the Weekly Return is accounted for chiefly by 9 cases in Somerset (Bridgwater R.D. 8, Burnham-on-Sea 1) and 26 cases in Pembroke (Haverfordwest R.D. 25, Fishguard 1).

The remaining 26 are scattered cases in Chester 2 (Stockport, Altrincham); Cornwall 1 (Scilly); Derby 2 (Staveley, Chesterfield R.D.); Durham 1 (Gateshead); Hertford 1 (Bishops Stortford); Kent 1 (Orpington); Lincoln 1 (Scunthorpe); London 8 (Hampstead 2, St. Marylebone 1, Stepney 3, Wandsworth 1, Westminster 1); Middlesex 1 (Ruislip); Northumberland 1 (Newcastle-on-Tyne); Nottingham 1 (Warsop); Southampton 1 (New Forest R.D.); Surrey 3 (Coulsdon, Sutton, Godstone R.D.); Warwick 1 (Rugby); Glamorgan 1 (Swansea).

In the Highbridge area of Somerset 30 cases have been reported up to the present time with 3 deaths. No direct evidence of the cause of the outbreak has yet been discovered. Dr. J. F. Davidson, county medical officer, is being assisted in his investigations by Dr. Norman Smith of the Ministry of Health. All public water is being chlorinated and instruction given to boil both water and milk, although so far there is no indication that the infection is being spread by either. Sunday schools and infant schools at Highbridge and Huntspill have been closed for the time. Huntspill itself is now taking its water from the Bridgwater town supply which is easier to chlorinate than is the rural supply. Axbridge isolation hospital has been reserved for the typhoid cases, other infectious diseases being accommodated for the time elsewhere. At Burnham-on-Sea employees in local industries coming from the Highbridge area have been asked to remain at home and the public has been advised against the eating of lettuce and tomatoes.

In North-west Pembroke around St. David's 29 cases have been notified with 2 deaths. All the patients have been sent to the isolation hospital on the outskirts of Pembroke Dock where a scarlet fever ward has been cleared, and there has been some local apprehension from the concentration of typhoid cases in so populous an area. Here again Dr. H. Middleton, county M.O.H., has stated that all possible precautions have been taken, and special injunction has been issued to those who handle food to wash their hands before doing so.

In Northumberland 21 cases in all have recently been reported. The Newcastle health department states that none of the patients is now seriously ill and that so far it has not been found possible to trace the source of the infection.

The Comprehensive Health Visitor

Since 1929 the tendency has been for local authorities to appoint health visitors, each of whom will carry out all the duties of health visiting and nursing, including school nursing. In a paper published in the *Journal of State Medicine* for January, 1938, Miss E. J. Moorehead, superintendent of health visitors at St. Helens, brings forward weighty objections to this policy, but does not perhaps give due value to the three reasons why most medical officers of health favour it. The chief of these is that the divorce of school medicine from child welfare inhibits the continuance of supervision—and supervision of the rearing of children is the main function of the health visitor. Miss Moorehead thinks it an advantage to dissociate preventive from curative nursing. We do not accept this argument, for when preventive work becomes clinical, being applied to individuals, its separation from curative work is artificial. We agree that if health visitors are to do all public health nursing, their district must be limited; but people do not like unnecessarily many invaders of their homes and we submit that a district is better served by health visitors to each of whom a part of the area is assigned than by the same number serving the whole in different capacities.

ABSORPTION OF FAT.—At a meeting of the Society of Public Analysts and Other Analytical Chemists on Feb. 2nd, with Dr. G. Roche Lynch, the president, in the chair, Dr. A. C. Frazer read a paper on fat absorption and metabolism. He presented evidence that passage of fats through the walls of the small intestine can take place without hydrolysis to fatty acids and glycerol. In cats such hydrolysis cannot occur, for there is no lipase in the intestines. In human beings lipase is present and part of the fats ingested penetrates the intestinal walls as fatty acids, but a large proportion penetrates unchanged. The fatty acid portion passes to the fat depôts by way of the portal vein, liver, and hepatic vein, but the unhydrolysed fat avoids the liver and passes to the fat depôts by way of the lacteal lymphatics and the systemic vessels. The presence of particles of unhydrolysed fat in the blood was detected microscopically by use of dark-ground illumination, and this means was used to study variations in the concentration of the fat particles in the blood in course of digestion.

MEDICAL NEWS

University of Cambridge

On Feb. 4th the following degrees were conferred :—

M.D.—R. M. Dowdeswell.
M.B., B.Chir.—J. S. Joly and R. D. I. Beggs.
M.B.—K. L. Buxton (by proxy).

Titles of the degrees M.B. and B.Chir. were conferred during January on the following members of Girton and Newnham Colleges : A. C. Clark, G. E. Grove, and V. E. A. Sykes.

At recent examinations the following candidates were successful :—

D.M.R.E.

Part I.—Frederic Bush, S. J. H. Douglas, Heather D. Dowling, Theunis Fichardt, Kathleen M. Henderson, T. H. Hills, F. B. Kiernander, O. C. Levine, Kenneth Lumsden, R. L. Mansi, A. M. Mansour, John Morton, R. S. Padaki, C. N. Pulvertaft, S. J. R. Reynolds, Alice M. Ross, Amnuey Smerasuta, C. G. Talwalkar, S. El D. H. El Taoudi, W. E. M. Topping, Leslie Werbeloff, and M. A. A. Zohdy.

University of London

On Mondays, Feb. 28th, March 7th, and 14th, at 5 P.M., Mr. J. F. Danielli, Ph.D., will lecture on surface chemistry and biology. The lectures will be held at University College, Gower-street, W.C., and are open to all.

University of Durham

Dr. Albert Gild and Dr. J. W. M. Sutherland have been appointed demonstrators in anatomy at King's College, Newcastle-upon-Tyne.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow the following candidates were successful :—

M. J. Ackerhalt, Z. S. Alpert, Abraham Appel, Stewart Bauman, R. A. Blair, Ernst Cohn, R. M. Cross, T. B. Dev, R. B. Dobson, E. F. Duschock, M. M. Elkind, Mandel Friedman, Jacob Gillman, K. A. Graf, Hans Grundmann, Victor Guyer, A. T. R. Hamilton, T. W. Howat, Hugh Hutton, W. M. Jamieson, K. E. Karunaratne, Yetta Kuper, Murray Levin, Hyman Leibowitz, Meieris Lichtensteinas, J. T. McCutcheon, P. W. F. McIlvenna, James McMillan, K. P. F. J. M. Mangold, William Meadow, Jay E. Mishler, W. S. Murray, R. P. Myers, Anna Noll, U. E. Oberworth, Samuel Pollack, J. S. Pomerantz, Livingston Rae, Arron Rapoport, F. L. Reardon, C. G. Rosenstock, William Rothman, Nathan Schwartz, Louis Scovronek, Morton Shapiro, Max R. Simon, W. E. C. Taylor, A. J. Walder, Morris Weinschel, David Wilson, and A. A. Wright.

Royal College of Physicians of Edinburgh

A quarterly meeting of the College was held on Tuesday, Feb. 1st, Dr. Alexander Goodall, the president, in the chair. Dr. John Dalziel Wyndham Pearce (London), Dr. John Paton McGibbon (Edinburgh), and Dr. William Melville Arnott (Edinburgh) were introduced and took their seat as fellows of the college.

Course in Venereal Diseases

During March, April, and May a course on modern methods in the diagnosis and treatment of venereal diseases will be given by Lieut.-Colonel E. T. Burke at the London County Council (Whitechapel) Clinic, Turner-street, E. Further particulars will be found in our advertisement columns.

Health on the Roads

The Royal Automobile Club, reporting on the health of its staff of guides, who are to be found on the roads in all parts of the country, states that over a period of twelve months the total amount of time lost through sickness was only 750 days. The road staff of the R.A.C. numbers approximately 1000 men, and taking into consideration rest-days and holidays, the total number of days that could be worked would be about 300,000. These men work exclusively in the open air—patrolling on motor-cycles, carrying out point duty at cross-roads, car-parking, and so forth. As a rule the harder the weather, the longer are the hours that have to be worked, for it is when conditions are most severe that a guide will probably find most to do.

Sir Ernest Graham-Little, M.P., has been elected an honorary member of the Argentine Dermatological Society.

British Institute of Philosophy

An address on philosophy and the common reader will be given by Prof. L. S. Stebbing on Tuesday, Feb. 15th, at 8.15 P.M., at University College, Gower-street, London, W.C. Cards of admission can be obtained from the director of studies of the institute, at University Hall, 14, Gordon-square, W.C.1.

Order of the Nile

The King has given permission to Dr. R. A. Gardner and Mr. A. K. Henry to wear the insignia of Commander of the Order of the Nile, which have been conferred on them by the King of Egypt in recognition of their services in the employment of the Government. Dr. Gardner was formerly director of the Institute of Radiology at the Egyptian University, Cairo, and Mr. Henry, who is now reader in surgery at the British Postgraduate Medical School, was professor of clinical surgery in the Faculty of Medicine, Cairo.

Ella Sachs Plotz Foundation

The trustees of this foundation are anxious to make known the resources of their fund for the advancement of scientific investigation. The foundation seldom or never offers stipends to investigators; nor does it provide apparatus and materials which are ordinarily part of laboratory equipment. Its special purpose is to give grants for the purchase of apparatus and supplies required for special investigations and for the payment of unusual expenses, including technical assistance. The research should bear closely on medicine or surgery, and the maximum size of grants will usually be less than $500. In the fourteen years of its existence the foundation has made 308 grants and investigators have been aided in 32 countries. Applications for assistance should arrive before May 1st, including statements about the nature of the investigation, the amount of money wanted, and the way in which it will be spent. The secretary of the executive committee is Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695, Huntington-avenue, Boston, Massachusetts, U.S.A.

Educational Gymnastics and Keep-Fit Work

On Jan. 26th a demonstration of educational and recreative gymnastics for girls and women was given under the auspices of the Ling Physical Education Association at the County School for Girls, East Sheen, and at the Shillingfleet Church Hall, Barnes. Educational gymnastics were shown by senior girls of the county school under Miss V. M. Frost, who laid particular emphasis on the maintenance of free natural movement, on the correction of postural defects, and on the recreative element in school gymnastics. Recreative gymnastics were then demonstrated by the keep-fit class of the Army and Navy Stores under Miss Docking. The girls' daily work is chiefly sedentary, and the aims of the class are to ensure general enjoyment, good poise and posture, mobility combined with strength, and the development of good muscular tone and control. The scheme of work is based on Ling's Swedish system, with the addition of easy dances. Finally there was a demonstration by a keep-fit class for older women, taken by Mrs. Thompson. This consisted of women between the ages of 30 and 50, who have an hour's lesson on one afternoon a week. All the members lead busy lives, the great majority being housewives and mothers. Mrs. Thompson explained that the chief aims in classes for older women were to cultivate such beneficial qualities as grace, good figure, and poise, and to cure or ameliorate the physical deformities arising from many years of hard work. Easy and enjoyable corrective exercises were employed, carried out to music, as in all keep-fit classes.

The gymnastic work was followed by a discussion in which the medical visitors, gymnasts, and members of the classes took part.

Hospitals for Civilian Casualties in Scotland

In considering arrangements to be made for civilian casualties caused by air-raids the Government has arranged for a survey of the hospital accommodation of the country (see *Lancet*, Jan. 22nd, 1938, p. 234). In Scotland the survey is being undertaken by the Department of Health. Lieut.-Colonel A. D. Stewart, M.B., superintendent of the Edinburgh Royal Infirmary, and Dr. J. C. Knox, medical superintendent of the Aberdeen Royal Infirmary, will assist the Department. The officers responsible include Dr. Thomas Ferguson, Dr. Ernest Watt, Dr. J. C. Knox, and Dr. Alexander Shearer. The General Board of Control for Scotland will undertake the survey of mental hospitals and mental deficiency institutions.

Better Treatment of Fractures

Speaking at Ipswich on Tuesday last Sir Kingsley Wood, the Minister of Health, spoke of the substantial proportion of incapacity represented by fractures and allied injuries. To-day considerably over 200,000 fractures were treated annually in hospitals up and down the country, and there was a general demand for a better service, inasmuch as only about a quarter of the cases were dealt with in departments organised in accordance with modern principles. Industry was particularly interested because the period of disability could be enormously reduced by modern methods of treatment. Workers could be saved much suffering and discomfort and the employers much dislocation of their business. The up-to-date fractures department at the East Suffolk and Ipswich Hospital, he said, was already proving of great benefit to the inhabitants of the borough and surrounding districts.

A Liverpool Cancer Campaign

The Associated Voluntary Hospitals Board has appointed a commission to report on the investigation and treatment of cancer in the Liverpool area, and on the possibility of extending and improving this work. Particular attention is to be paid to the best way of using and coördinating the available hospital and research facilities. The commission is also to decide whether any change is needed in the organisation, policy, or construction of the Liverpool Radium Institute and Hospital for Cancer. The following are the members of the commission: Dr. Arnold D. McNair (chairman), Prof. R. E. Kelly, Prof. Henry Cohen, Prof. James Chadwick, Prof. A. Leyland Robinson, and Mr. Roland H. Thornton, chairman of the Associated Voluntary Hospitals Board.

Medical Diary

February 14th to February 19th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY.—5.30 P.M., general meeting of fellows.
Pathology. 8.15 for 8.30 P.M., Laboratory meeting in the pathological department, St. Thomas's Hospital, S.E.
THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. F. Sherry-Dottridge: (1) Scleroderma, (2) Case for diagnosis.
Neurology. 8.30 P.M., clinical meeting at the National Hospital, Queen-square, W.C.
FRIDAY.
Physical Medicine. 4.30 P.M., Dr. Wilfred Pearson: The Effects of Strain in Children. Dr. Nina Kellgren and Dr. J. B. Mennell will also speak.
Obstetrics and Gynæcology. 8 P.M., Prof. A. M. Carr-Saunders, Dr. R. R. Kuczynski, Mr. Eardley Holland, Dr. C. P. Blacker, Prof. J. C. Drummond, D.Sc., and Prof. J. Young: Medical Aspects of the Decline of the Population.
Radiology. 8.30 P.M., Dr. C. G. Teall, Dr. Campbell Golding, and Mr. A. T. Fripp: Deformities in the Region of the Hip-joint.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY.—8.15 P.M., Dr. H. M. Hanschell and Dr. C. C. Chesterman (Belgian Congo): Climatic Bubo or Lymphogranuloma Inguinale. Dr. G. W. M. Findlay will also speak.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
THURSDAY.—2.30 P.M. (11, Chandos-street, W.), Dr. S. Sharman: Some Observations on the Theory of Perception.

MEDICAL SOCIETY OF LONDON, 11 Chandos-street, W.
MONDAY.—8.30 P.M., Dr. J. H. Douglas Webster, Dr. W. M. Levitt, and Dr. G. E. Vilvandré: What Can be Expected of Deep X Ray Therapy.

BRITISH ASSOCIATION OF RADIOLOGISTS, 32, Welbeck-street, W.
FRIDAY.—4 P.M., Sir Walter Langdon-Brown: The Pursuit of Shadows. (Skinner lecture.)

BRITISH INSTITUTE OF RADIOLOGISTS, 32, Welbeck-street, W.
THURSDAY.—8.30 P.M., Mr. H. M. Parker: Uniform Irradiation in Interstitial Radium Therapy. Mr. A. Nemet and Mr. A. C. Gunstone: The Metrion Integrating Dosimeter.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.
FRIDAY.—5 P.M., Dr. Hugh Paul: Present Practice in regard to Quarantine and Disinfection.

CHELSEA CLINICAL SOCIETY
TUESDAY.—8.30 P.M. (Rembrandt Hotel, Thurloe-place, S.W.), Dr. C. F. White: Quarantine, Past, Present, and Future.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY
THURSDAY.—5 P.M., visit to the Metropolitan Police Laboratory, Hendon.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
MONDAY.—5 P.M., Sir Arthur Keith, F.R.S.: The Prehistoric People of Mount Carmel.
WEDNESDAY.—5 P.M., Dr. W. E. Gye: Some Recent Work in Experimental Cancer Research.

UNIVERSITY OF BIRMINGHAM
THURSDAY.—4 P.M., Sir Henry Dale, F.R.S.: Chemical Transmission of the Effects of Nerve Impulses. (First William Withering lecture.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland-place, W.C.
WEDNESDAY.—3.30 P.M., Dr. Henry Yellowlees: Mental Hygiene in Modern Life.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Prof. J. H. Dible: Pathology of Certain Respiratory Diseases. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. J. G. Greenfield: Neuropathology.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Dr. Alan Moncrieff: Feeding of the New-born Infant.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Prof. Lambert Rogers: Surgery of the Spinal Cord and Peripheral Nerves.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY.—5 P.M., Dr. H. Corsi: Diseases of the Nails.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of Some Common Skin Diseases. (Chesterfield lectures.)

ST. GEORGE'S HOSPITAL, S.W.
THURSDAY.—5 P.M., Dr. Antony Feiling: neurological demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. Alan Moncrieff: Rickets and Tetany. 3 P.M., Dr. W. W. Payne: Serum Calcium, Phosphorus and Phosphatase.
Out-patient clinics daily at 10 A.M., and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY.—3.30 P.M., Mr. G. Elmquist: Demonstration of Remedial Exercises.
TUESDAY.—3.30 P.M., Dr. J. P. Martin: Neurosyphilis (3).
WEDNESDAY.—3.30 P.M., Dr. F. M. R. Walshe: clinical demonstration.
THURSDAY.—3.30 P.M., Dr. C. Hinds Howell: Myelitis.
FRIDAY.—3.30 P.M., Dr. J. St. C. Elkington: Acute Infectious Disease of the Brain.
Out-patient clinic daily at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY.—4 P.M., Mr. Archer Ryland: Demonstration of Museum Specimens.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY.—4 P.M., Dr. Wilfred Pearson: Indigestion in Infancy.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Dr. Philip Ellman: Physical Medicine in Emphysema, Chronic Bronchitis, and Bronchiectasis.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SATURDAY.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W., all-day course in gynæcology. F.R.C.S. (PRIMARY) COURSE IN PHYSIOLOGY: Mon., Wed., and Fri., at 5.30 P.M.—ST. JOHN'S HOSPITAL, 5, Lisle-street, W.C., afternoon course in dermatology. (Open to non-members.)—PRINCESS ELIZABETH OF YORK HOSPITAL, Shadwell, E., all-day course in children's diseases.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY.—4 P.M., Mr. Zachary Cope: Actinomycosis.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Dr. William MacAdam: Some Recent Advances in Endocrinology.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Royal Maternity and Women's Hospital), Dr. R. A. Lennie: Antenatal Care.

Vacancies

For further information refer to the advertisement columns

Belfast, Queen's University.—Lecturer in Anatomy, £450.
Birkenhead, Clatterbridge (County) General Hosp.—Jun. Res. Asst. M.O., at rate of £200.
Birmingham, Selly Oak Hosp.—Jun. M.O., at rate of £200.
Blackburn County Borough.—Asst. M.O.H., £600.
Braintree, Black Notley Sanatorium.—Jun. Asst. M.O., £250.
Cambridge, Addenbrooke's Hosp.—H.S., at rate of £130.
Cannock Urban District Council.—Asst. M.O.H. and Asst. School M.O., £550.
Canterbury, Kent and Canterbury Hosp.—Hon. Dermatologist.
Cardiff, Welsh National School of Medicine.—Three Scholarships, £200, £150, and £150.
Carlisle, Cumberland Infirmary.—H.P., two H.S.'s, and H.S. to Spec. Depts., each at rate of £160.
Central London Ophthalmic Hosp., Judd-street, W.C.—Sen. and Jun. H.S., £120 and £100 respectively.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Third Res. H.S., at rate of £75. Also Assts. in Out-patient Dept.
Charing Cross Hosp., W.C.—Surg. Reg., £150.
Chatham, County Hosp.—Cons. Physician and Cons. Surgeon, each £170.
Chesterfield and North Derbyshire Royal Hosp.—Cas. O. and Fracture H.S., at rate of £200.
Chichester, West Sussex County Mental Hosp.—Med. Supt., £1100.
Derbyshire County Council.—Asst. County M.O.H., £700.
Doncaster Royal Infirmary and Dispensary.—Cas. H.S., £175.
Douglas, Noble's Isle of Man Hosp. and Dispensary.—Res. H.S., £175.
Eastbourne, Royal Eye Hosp.—H.S., £100.
Edgware, Redhill County Hosp.—Physician, Grade I, £1000.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Med. Reg., £100.
Folkestone Royal Victoria Hosp.—Hon. Anæsthetist.
Fulham Metropolitan Borough Maternity Home and Clinic.—Res. M.O., &c., £350.
Glasgow Corporation Mental Hosps.—Jun. Asst. M.O. for Hawkhead Mental Hosp., £300.
Gloucestershire Royal Infirmary, &c.—H.S. to Ear, Nose, and Throat Dept., at rate of £150.
Gravesend Borough.—Asst. M.O.H. and School M.O., £600.
Hellingly, East Sussex County Mental Hosp.—Jun. Asst. Res. M.O., £350.
Herefordshire General Hosp.—H.S. to Cas. and Ear, Nose, and Throat Depts., £100.
Hosp. for Diseases of the Skin, Blackfriars, S.E.—Clin. Assts. Also Member for Hon. Staff.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Aural Reg., £150.
Huddersfield, Bradley Wood Sanatorium.—Res. M.O. and Asst. M.O.H., £600.
Huddersfield County Borough.—Asst. School M.O., £500.
Hull Royal Infirmary.—Second Cas. O., at rate of £150.
Isleworth, West Middlesex County Hosp.—Obstet. Surgeon, Grade II, £650. Also Res. Cas. M.O., at rate of £350.
Kettering and District General Hosp.—Cons. Physician. Also H.P., at rate of £150.
Kingston County Hosp.—Res. Asst. M.O., at rate of £250.
Lancashire County Council.—Asst. County M.O., £800.
Leamington Spa, Warneford General Hosp.—Res. Cas. O. and H.S., at rate of £150.
Leeds City.—Asst. M.O., £500.
Leeds Public Dispensary and Hosp.—H.P., at rate of £150.
Leicester City General Hosp.—Two Res. M.O.'s, each at rate of £300.
Liverpool University.—Two Demonstratorships in Physiology, each £300.
Lochgilphead, Argyll and Bute District Mental Hosp.—Res. Asst. M.O., £300.
London County Council.—Asst. M.O., Grade II, £250.
London Homœopathic Hosp., Gt. Ormond-street, W.C.—H.S. and Gynæcological H.S., each at rate of £100.
London Hosp., E.—Physician. Also Asst. Physician.
London Lock Hosp., 283, Harrow-road, W.—Res. M.O., at rate of £175.
London University.—University Readership in Embryology, £750.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Ancoats Hosp.—Cas. O., £175.
Manchester Royal Children's Hosp., Pendlebury.—Two Asst. M.O.'s to Out-patients' Dept., each at rate of £150.
Manchester University.—Sir Henry Royce Fellowship, £500.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Merthyr Tydfil County Borough.—Asst. M.O.H. and Asst. School M.O., £500.
Metropolitan Hosp., Kingsland-road, E.—Cas. O. and Res. Anæsthetist, £100.
Miller General Hosp., Greenwich-road, S.E.—Cas. O., at rate of £150. Also H.P. and H.S., each at rate of £100.
Newcastle General Hosp.—H.S. and Jun. Clin. Asst. to Joint Committee's V.D. Clinic, £250.
Newcastle-upon-Tyne Education Committee.—Asst. School M.O., £500.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. Surgeon.
Norfolk, Kelling Sanatorium, Holt.—Second Asst. Res. M.O., £350.
Nottingham Children's Hosp.—Res. H.P. and Res. H.S., each at rate of £150.
Plymouth City General Hosp.—Asst M.O., £300. Also Jun. Asst. M.O., at rate of £250.
Plymouth, Prince of Wales's Hosp., Greenbank-road.—Res. Anæsthetist and H.S. to Spec. Depts., at rate of £120.
Prince of Wales's General Hosp., N.—Hon. Med. Reg., £100. Also Jun. H.P. and two Jun. H.S.'s, each at rate of £90.
Queen Mary's Hosp. for the East End, E.—Hon. Asst. Obstet. and Gynæcological Surgeon.
Queen's Hosp. for Children, Hackney-road, E.—Clin. Asst. to Med. Out-patients, 5*s.* per attendance.
Royal Air Force Medical Service.—Commissions in Medical Branch.
Royal Eye Hosp., St. George's-circus, S.E.—Sen. H.S. and two Asst. H.S.'s, at rate of £150 and £100 respectively.
Royal Free Hosp., Gray's Inn-road, W.C.—Res. Cas. O., at rate of £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Sen. Res. O., at rate of £150.
Royal Naval Medical Service.—M.O.'s.
Royal Waterloo Hosp. for Children, &c., Waterloo-road, S.E.—Anæsthetist, £52.
Runcorn, Cheshire, Evans Biological Institute.—Sen. Bacteriologist.
St. Bartholomew's Hosp., E.C.—Chief Asst. in X Ray Diagnostic Dept., £400–£500. Also Dental H.S., at rate of £80.
St. Helens Hosp.—Jun. H.S., £150.
St. John Clinic and Institute of Physical Medicine, Ranelagh-road, S.W.—Med. Reg., £200.
St. John's Hosp., Lewisham, S.E.—Res. Surg. O., £200.
Salisbury General Infirmary.—H.S., at rate of £125.
Scotland, Department of Health.—Two Regional M.O.'s, each £800. Also two M.O.'s, each £750.
Southampton Children's Hosp., &c.—Res. M.O., at rate of £150.
Southend Municipal Hosp.—Asst. M.O., £325.
South London Hosp. for Women, Clapham Common, S.W.—Clin. Assts.
South Shields, Ingham Infirmary.—H.S., £150.
Staffordshire General Infirmary.—Second H.S., £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S., at rate of £150.
Surrey County Council.—Asst. M.O., £600.
Swansea General and Eye Hosp.—Asst. Pathologist, £500.
Tancred's Studentships.—Each £100.
Tunbridge Wells, Kent and Sussex Hosp.—H.P., £150.
West London Hosp., Hammersmith-road, W.—Med. Reg., £100. Also Res. Anæsthetist, at rate of £100.
Westminster Hosp., Broad Sanctuary, S.W.—Physician.
Willesden General Hosp., Harlesden-road, N.W.—Gynæcological Registrar.
Windsor, King Edward VII Hosp.—H.S., £120.
Medical Referee under the Workmen's Compensation Act, 1925, for the Berwick-upon-Tweed County Court District (Circuit No. 1). Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before March 3rd.

Appointments

BUXTON, R. G., L.R.C.P. Edin., D.C.O.G., Assistant Medical Officer of Health for Eccles.
*CAMERON, J. A. M., M.D. Manch., F.R.C.S. Edin., Resident Medical Officer at the Radium Institute, London.
FITZGERALD, F. P., M.B. Dubl., F.R.C.S.I., Fracture Officer and Orthopædic Registrar at the Royal Northern Hospital, London.
HOWAT, H. T., M.B. St. And., M.R.C.P. Lond., Resident Medical Officer at Manchester Royal Infirmary.
LEWIS, E. E., F.R.C.S. Eng., Surgical Registrar at King's College Hospital.
LYNCH, G. A. C., M.D. Liverp., D.P.H., Assistant Medical Officer of Health for Burnley.
ROBIN, I. G., M.B. Camb., F.R.C.S. Eng., Second Ear, Nose, and Throat Surgeon to the Royal Northern Hospital, London.
RYCROFT, G. J., Barrister-at-law, City Coroner of Manchester.
TALBOT, G. G., M.B. N.Z., F.R.C.S. Eng., Part-time Ophthalmic Surgeon at Ealing Health Centres.
WHYTE, A. HEDLEY, M.S. N.Z., F.R.C.S. Eng., Hon. Surgeon to the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Colonial Medical Service.—The following appointments and promotions are announced :—
FINLAYSON, D. I. C., M.B., F.R.C.S. Edin., M.C.O.G., Assistant Surgeon at the Public Hospital, Georgetown, British Guiana ;
JONES, G. F., M.B. Lond., Medical Officer, Malaya ;
PORTER, G. E. J., M.R.C.S. Eng., District Medical Officer, Cyprus ;
RUSSELL, P. W. DILL, M.R.C.S. Eng., District Medical Officer, Cyprus ; and
BELL, P. S., M.B., M.R.C.P. Lond., D.T.M. & H., Senior Medical Officer, Somaliland.

Hospital for Sick Children, Great Ormond-street.—The following appointments are announced :—
COPE, R. W., M.R.C.S. Eng., D.A., Anæsthetist ;
HARRIS, J. R. G., M.B., D.A., Anæsthetist ;
EDWARD, D. G. FF., M.D. Lond., Assistant Pathologist ; and
WILLIAMS, J. R. C., M.B., Casualty Officer.

West London Hospital.—The following appointments are announced :—
DAVENPORT, R. C., M.B. Lond., F.R.C.S. Eng., Ophthalmic Surgeon ;
MOFFATT, P. McG., M.D., M.R.C.P. Lond., F.R.C.S. Eng., D.O.M.S., Assistant Ophthalmic Surgeon ;
STEWART, T. GRAINGER, M.D. Edin., F.R.C.P. Lond., Consulting Neurologist ; and
GIBB, H. P., M.B. Camb., F.R.C.S. Eng., Consulting Ophthalmic Surgeon.

Medical Referee under the Workmen's Compensation Act, 1925, for the Whitehaven and Millom ; and Workington and Cockermouth County Court Districts (Circuit No. 3) : Dr. ALEXANDER GIBSON HENDERSON.

* Subject to confirmation.

NOTES, COMMENTS, AND ABSTRACTS

AN INTERNATIONAL PHARMACOPŒIA

WITH a view to the international unification of pharmacopœias the council of the League of Nations has just appointed a technical commission of pharmacopœia experts. The commission is constituted of eight members representing Great Britain, Denmark, Belgium, France, Switzerland, Holland, the United States, and Soviet Russia. The chairman is Dr. C. H. Hampshire, secretary of the British Pharmacopœia Commission. The work of this commission will be in the first place to prepare a programme of studies, including the selection of suitable drugs for examination and the determination of a uniform method of analysis, assay, and preparation of the drugs selected. The technical examination will then be distributed among a number of national pharmacopœia commissions. It is intended that the results of the studies thus carried out shall take the form of a series of monographs on the different drugs. These monographs would be forwarded to the permanent secretariat in Brussels for circulation among the parties to the International Agreement for the Unification of Pharmacopœial Formulas for Potent Drugs of 1929 with a view to their being adopted internationally and eventually incorporated into an international pharmacopœia of powerful remedies. Thus a very important step has been taken towards the compilation of an international pharmacopœia and the selection of Dr. Hampshire as chairman of the new commission inspires confidence in its future.

PORTRAITS OF THE HUNTERS

A NOTE in THE LANCET of Dec. 7th last, about the Reynolds portrait of John Hunter, prompted an inspection of some other portraits of the brothers Hunter in the Royal College of Surgeons, two of William and one of John.

The last is by his brother-in-law, Robert Home. It shows John as a young, reddish-haired man. Unlike the Reynolds portrait it is a plain, simple, unimaginative depiction of the man in working garb as he appeared to his fellows in the laboratory from day to day. It is easy to perceive in it those qualities, self-reliance, dour persistence, uncouthness, pugnacity, that marked his career and not only enabled him as a great experimental physiologist to carry on his many and various inquiries into normal and morbid processes, but were responsible for his strained relations with his brother and with his professional colleagues, and his offensive rudeness to his wife and her guests. His ultimately fatal malady served to aggravate his lack of social grace.

In the picture there seems to be a suggestion of slight enlargement of the first interphalangeal joints of the fore and ring fingers. These may have been "anatomist's warts." Hunter looks young for rheumatoid arthritis. He was said to have suffered from gout, a most unlikely thing. His heredity and upbringing were remote from those typical of gout, and his habits were abstemious. "Gout" was often in the eighteenth century, like "influenza" in the twentieth, a diagnostic omnium gatherum, a convenient label for any illness the nature of which was not at once apparent, a very present help to the doctor harassed by the pressing inquiries of the patient's anxious and insistent friends. It was often "suppressed," and liable to "fly to the heart," and thus served to explain any painful condition in thorax or abdomen about or after middle age. And John Hunter had syphilis (self-inoculated) and angina pectoris.

Of the two portraits of William, that by R. E. Pine gives an impression of soft prettiness in sharp contrast to the alert vigour shown in the Reynolds (Glasgow University), the Chamberlin (Royal Academy), and the Zoffani (Royal College of Physicians) pictures. It is interesting to see that two of the joints of the right hand show enlargements quite as likely to be due to rheumatoid arthritis as to the gout from which William, like John, is said, with more reason, to have suffered.

The second portrait of William was described in the first edition of the College catalogue as "painted by Johann Zoffani"; in the later edition it is "ascribed to" him, indicating that a doubt of its authenticity had arisen. That doubt might well have been carried farther and Zoffani's name been dropped entirely. The picture is evidently a good copy by an unknown hand of the Reynolds portrait in the Hunterian museum at Glasgow University. That portrait was painted about 1780, three years before William's death. At that time Zoffani was a popular and fashionable portrait-painter, much more profitably engaged than in that copying of other men's work which he had been glad to do in his early days of hungry struggle in London.

The picture shows William as a little, dapper man, neat and pernickety in his dress, quick of movement, very much alive, clear and orderly, conscious of his position, not likely to allow himself to be "put upon," and withal possessed of strength and pugnacity; a Sir Peter Teazel endowed with force and determination, a pertinacious little man, not small. Unlike John, William was a bachelor, a clubbable man. We know of no amatory passage in his life. His attentions to the ladies were obstetric, not matrimonial.

One has only to look at this portrait and that of John by Home to understand the brothers' quarrel and its long endurance. Neither was of the yielding kind; each had the lowland Scot's long memory for a "difference." We may feel sure that John's visit to his brother's deathbed and his catheterising of him afforded him a grim satisfaction, a pleasing feeling of heaping coals of fire without any attendant childish nonsense about reconciliation with a William too weak and ill to do anything but accept the urgently needed relief. They were a dour pair; insatiable inquirers, hard workers, enduring haters, and persistent fighters. Didactic assertion, pertinacious argument were in the blood. They had the strength and the defects of their qualities, and by these they did their great work and lived their lives.

HOSPITAL LIBRARIES ABROAD

ALTHOUGH the British Red Cross Society and the Library Association have done much in recent years to improve the library service in hospitals the value of books to patients does not yet seem to have received the same recognition here as in some other countries. In the United States the organisation has been developed under professional direction and the hospital library is a definite branch of library work. The librarian of the Ann Arbor University Hospital, Miss A. H. Moisio, in the January issue of the *Library Association Record* gives a description of the service rendered to the 30,000 patients received there annually. Every effort is made to study and meet individual needs. In the tuberculosis unit, for example, "cultured and formative reading" is found to be most acceptable. Among the numerous examples cited of direct benefit derived by patients is one of a young woman whose muscle function was greatly limited by poliomyelitis. The librarian discovered that she had an unusual interest in cathedrals while the occupational therapist directed her to needlepoint. The result of this combined attention was that she produced a beautiful cathedral done in needlepoint—"a rare piece of perfect needlework"—and so found a means of self-expression. Stress is laid by Miss Moisio upon the importance of having books attractive in size, form, and outward appearance. The library service for the hospitals in Paris has reached a high standard of excellence in this respect. Dr. Louis Mourier, Director-General of the

Public Assistance in Paris, devotes a section to the description of the hospital libraries in the beautifully illustrated survey of the work of public assistance from 1920 to 1937, which has just been published by his department. The organisation is not based upon the hospital as a unit but upon the needs of each department. Infectious diseases must naturally be separated and usually maternity units are outside the general scheme. The patient suffering from cardiac trouble has a supply different from that provided for surgical cases and so on throughout the hospital. The voluntary helpers directed by professional librarians are required to know the contents of the books so that they may be able to provide the reading most suitable for the patient. The appreciation of the patients is demonstrated by the fact that in a circulation of 100,000 in a year not one has been destroyed or disfigured, and the loss has been less than one in a thousand. It is safe to say that there is no hospital in England which can approach to that record. The library service in the hospitals in Paris leads the way in France and possesses features which may well inspire admiration and emulation in this country.

RABIES IN VENEZUELA

LAST year a small outbreak of rabies was observed in the State of Táchira (Venezuela) by the medical officer of health, A. J. González, who has given a description of the cases.[1] Between the months of April and July 6 persons, ranging in age from six to fifty years, were admitted to hospital with rabies, and all of these died. Another 85 presented themselves for bites from animals suspected to be rabid. To 70 of these people a full course of prophylactic inoculations was given; the remaining 15 were not treated, for the supply of vaccine available was limited and the histories of these 15 cases were not, in the opinion of González, sufficiently definite to justify the use of any of it for them. None of them developed rabies. The plan proposed by González to prevent future catastrophes of this kind is compulsory prophylactic inoculation of all dogs. After the completion of the treatment a medal is fixed to the dog's collar. Any dog not wearing such a medal can then be seized and destroyed by the local authorities.

OPIUM AND COCAINE

THE report of the Permanent Central Opium Board of the League of Nations on its work during 1937 and on the statistics of narcotics for 1936 affords valuable information. It is a document of 185 pages with statistical tables and graphs showing the consumption per million inhabitants of morphine, heroin, and cocaine from 1932 to 1936. At its quarterly sessions the Board examines discrepancies between imports and exports of narcotics furnished by governments, and investigates whether the obligations of the countries which are parties to the several opium conventions and the convention of 1931 limiting the manufacture and distribution of narcotic drugs are faithfully complied with. Thus the stocks of raw opium reported by the Turkish authorities as in hand at the end of 1936 were 476,065 kg. instead of 820,870 kg. The attention of the Turkish government having been directed to this discrepancy, the Board received the assurance that "steps to fill the permanent gap in the system of supervision due to the exemption from control of opium within the country will shortly be taken."

Attention is called to the fact that in 1936 the world manufacture of drugs showed a general increase over the 1935 figures amounting to 30 per cent. in the case of heroin, 22 per cent. in the case of codeine, 6 per cent. in the case of cocaine, and of "unconverted" morphine of 2 per cent. The amount of morphine used for conversion into other drugs rose from 21,807 kg. in 1935 to 27,708 kg. in 1936—i.e., by 27 per cent. Increases of over one ton occurred in Soviet Russia, the United States, and France; the total increase for these three countries represented 68 per cent. of the increase for the whole world. Attention is called to the undesirably large stocks of raw opium in Macao and to the fact that in 1935 and 1936 much more opium was imported than was consumed in the colony in the shape of prepared opium (for smoking).

The report on the world stocks of coca leaves is vitiated by the fact that no stock returns have been received by the Board from Bolivia or Peru, both of which are important producing countries.

An interesting table is furnished showing the calculated yields of morphine from opium. The percentages varied in 1936 from 6·73 in Soviet Russia to 13·38 in Japan. For the United Kingdom it was 12·24. From an appended graph it appears that from 1932 to 1936 the consumption of morphine per million of the population was highest in Kuantung, Denmark, and Iceland. Next in the series come Norway, the United States, and Japan. Finland and Japan appear to give the highest records for the consumption of heroin per million inhabitants.

NEW TRYPANOCIDES

IN the January issue of the *Journal of Pathology and Bacteriology* Prof. C. H. Browning, F.R.S., in collaboration with G. T. Morgan, J. V. M. Robb, and L. P. Walls, reports on the trypanocidal action of certain phenanthridinium compounds. Two of these were found to be trypanocidal, doses approaching the maximum tolerated being curative for mice infected with *Trypanosoma brucei* when administered 24 hours after inoculation. Both compounds act on arsenic-fast strains of *T. brucei* and it is of interest that one of them, unlike most other trypanocides, influences *T. congolense* as much as *T. brucei*. The second preparation is without effect on *T. brucei*, it has some action on *Spirillum minus*.

BARON ALIBERT

THE January issue of the *Proceedings of the Royal Society of Medicine* contains a paper by Dr. J. D. Rolleston on the life and work of Baron Alibert read before the section of dermatology on the centenary of his death on Nov. 4th, 1837. Alibert occupies much the same position in the history of French medicine that Willan does among us, both being the founders of modern dermatology in their respective countries. Brought up like Trousseau to be a teacher of literature, he changed his plans at the French Revolution and took up medicine, qualifying in 1799 with a remarkable thesis on pernicious fevers which went through five editions. His rise in the profession was exceptionally rapid, as three years after qualification he was made full physician to the Hôpital Saint-Louis, which he made one of the most celebrated dermatological centres in the world. In addition to his works on diseases of the skin, of which the most famous, entitled "Description des maladies de la peau observées à l'Hôpital Saint-Louis et exposition des meilleures méthodes suivies pour leur traitement," appeared in parts between 1806 and 1814, he was a pioneer in hydrology and was the author of several works on therapeutics, of which he was the first professor in the Paris faculty of medicine. He also made numerous contributions to periodical literature not only on dermatology and therapeutics but also on biography and belles lettres. His "Physiologie des Passions," first published in 1825, of which a fourth and posthumous edition appeared in 1861, won him the Montyon prize and was translated into German and Spanish. Dr. Rolleston illustrated the high esteem in which Alibert was held not only in France but also in this country by the obituary notices that appeared in the *Gentleman's Magazine*, which gave an intimate picture of the man, and in the *London Medical and Surgical Journal*. Alibert's name is always associated with the "tree of dermatoses," a classification in which he sought to do for

[1] *Bol. Minist. Sanidad Asist. Soc.* Estados unidos de Venezuela, 1937, **1**, 1144.

skin diseases what de Jussieu had done for plants. The classification however was subjected to severe criticism, especially by Bateman, though Gaucher described it as the first draft of a scientific and methodical study of the skin. Dr. Rolleston attributed Alibert's high rank in the history of French medicine and of dermatology in particular to the following causes. In the first place he established the first independent clinic of dermatology in France. Secondly, he described several new diseases such as mycosis fungoides, Aleppo boil, keloid, seborrhœa, and scleroderma. Thirdly, he introduced the terms "dermatosis," "dermatolysis," and "syphilides," which found a permanent home in dermatological nomenclature as well as many others which have not survived. Fourthly, though not to be compared with Trousseau, his successor in the chair of therapeutics, he made many valuable contributions to this branch of medicine. Fifthly, he was the first to introduce coloured illustrations into dermatological works. And lastly, he made the Hôpital Saint-Louis the Mecca of dermatologists throughout the world.

FACILITIES FOR RADIUM TREATMENT

THE secretary of University College Hospital writes: There is a certain amount of time available for the treatment of cases of malignant disease, other than patients of the hospital, with the two-gramme mass unit of radium. It is particularly suitable for the irradiation of superficial carcinoma, growths of the mouth and pharynx, and glandular fields. Applications for the treatment of patients should be sent to the Harker Smith Registrar.

NEW PREPARATIONS

CARBOMUCIL is a preparation of activated charcoal in granules containing a central core of the desiccated vegetable mucin sold by the manufacturers (H. R. Napp Ltd., 3, Clements-inn, London, W.C.2) under the name of Normacol. The advantages claimed for Carbomucil are (1) that very little of it disintegrates before reaching the bowel, where its adsorbent action is required; (2) that it forms a soft gelatinous mass which is well mixed with the intestinal contents and is thus brought into "complete contact with the toxic agents"; and (3) that, unlike ordinary charcoal, it favours defæcation rather than constipation. Its use is recommended "in all toxic conditions of the intestinal tract," including dysentery and diarrhœa.

STAPHYLOCOCCUS ANTITOXIN (REFINED AND CONCENTRATED).—Parke, Davis and Co. (Beak-street, W.1) prepare this antitoxin in bulbs, each of which contains 10,000 international units. In ordinary staphylococcal infections it is suggested that 10,000 to 20,000 units will suffice, but in more severe cases from 50,000 to 100,000 units may have to be given during the first twenty-four hours. The antitoxin is usually administered intramuscularly, but intravenous injections may be resorted to when immediate neutralisation of toxin seems imperative.

AZOCHLORAMID is described as a "chlorine germicide, odourless, non-irritating, and non-selective in bactericidal action," for dressing, packing, and irrigating infected wounds, cavities, and abscesses. It is a complex aliphatic organic chloramine (N-N′-dichloroazodicarbonamidine) soluble in water and fats, oils, alcohols, ketones, and esters. Its special property is the extremely slow rate with which it liberates chlorine; it is said to remain potent for long periods in the presence of organic matter, and chlorine is found in considerable quantities in Azochloramid solutions removed after 24 hours in the pleural cavity. This exceptional stability reduces the number of dressing changes required. The preparation is available as a solution in triacetin, for application to wounds, and in a saline mixture for making irrigating solutions. It is sold by Wallace and Tiernan Ltd., Power-road, Gunnersbury, W.4.

The flavour and the friability of Ostocalcium Tablets, supplied by GLAXO LABORATORIES LTD. (Greenford, Middlesex), has been improved. Calcium phosphate (2½ grains) has been added to the original formula (7½ grains calcium sodium lactate and 500 international units of vitamin D). It is stated that each Ostocalcium Tablet now supplies 1½ grains (0·1 gramme) of calcium.

LABORATORY NATIVELLE LTD. (North Circular-road, N.W.2) inform us that Nativelle's Digitaline is now supplied in tablets, 1/600 grain (pink) and 1/240 grain (white). Nativelle's Granules and Solution are still available.

ZERMOPAD LTD. (4, Queen Victoria-street, E.C.4) make a sachet partly filled with powder which rises to a temperature of 140°–170° F. on the addition of a tablespoonful of water and remains hot for periods up to 10–14 hours. The life of the pad is about 60 hours, and it is a convenient application where local heat is required. The manufacturers ask us to say that they will send a Zermopad to any practitioner who thinks it might alleviate pain in a case of malignant disease under his care.

ANNUAL CHARITIES REGISTER, 1938.—We have received from Messrs. Longmans, Green and Co., a copy of the forty-fifth edition of the Annual Register of Charities and Public Institutions of the metropolis (Pp. 530, 8*s*. 6*d*.) which they publish for the Charity Organisation Society. On the cover it is stated with truth that the book is "indispensable for the service of persons in all kinds of trouble and need." Details of more than 2700 institutions and societies are given, and the classified list of contents shows the scope of the survey. Its thirty-nine sections include chapters describing facilities for the care of the blind, of the deaf and dumb, and of old people; others give lists of general and special hospitals, and of convalescent institutions; while other headings include pensions, maternity and child welfare, emigration, and social work among the unemployed. There is a general index at the end of the book.

Births, Marriages, and Deaths

BIRTHS

BOWESMAN.—On Feb. 4th, at Billericay, the wife of Dr. R. Bowesman—a son.

CHIESMAN.—On Feb. 3rd, at Egerton-gardens, S.W.3, the wife of Dr. W. E. Chiesman—a daughter.

FITZGERALD.—On Feb. 5th, at Nuffield House, London, the wife of Dr. J. A. K. Fitzgerald, Colonial Medical Service—a daughter.

PASSMORE.—On Feb. 2nd, at Coonoor, S. India, the wife of Dr. R. Passmore—a son.

ROBB.—On Dec. 31st, 1937, at 41, Symonds-street, Auckland, New Zealand, to Helen, wife of Douglas Robb, F.R.C.S.—a daughter.

MARRIAGES

FABER—WATSON.—On Feb. 3rd, at St. Mary's Church, Welwyn, Herts, Hamilton S. Faber, M.R.C.S., to Jean Ogilvy, daughter of Captain D. C. O. Watson, of Welwyn.

THORNE—LESLIE.—On Feb. 2nd, at St. Mary's, Twickenham, Lieut. William Thorne, I.M.S., to Sylvia May, daughter of Capt. G. H. Leslie, of Hampton Hill.

DEATHS

COURT.—On Feb. 8th, Sir Josiah Court, M.R.C.S. Eng., J.P., of Staveley, Derbyshire, in his 98th year.

HAWTHORN.—On Feb. 4th, Henry William John Hawthorn, M.R.C.S. Eng., L.D.S., of Wellington, Shropshire.

HENSTOCK.—On Feb. 3rd, at De Vere-gardens, W., John Lea Henstock, M.R.C.S. Eng., late of Viña del Mar, Chile.

HODDER.—On Feb. 3rd, at Stafford, Andrew Edward Hodder, D.S.O., M.B. Camb.

JONES.—On Feb. 4th, at Campden Hill-court, W., David Llewellyn Jones, F.R.C.S. Eng., aged 80.

NITCH-SMITH.—On Feb. 3rd, at Ealing, Reginald Nitch-Smith, M.R.C.S. Eng., aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.